UNIVERSITY OF PENNSYLVANIA

EMPLOYMENT FLUCTUATIONS IN PENNSYLVANIA 1921 TO 1927

J. FREDERIC DEWHURST

A THESIS

IN ECONOMICS

PRESENTED TO THE FACULTY OF THE GRADUATE SCHOOL IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY

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PREFACE

The collection of the data forming the basis of this study was commenced more than five years ago in an endeavor to meet the need of the Federal Reserve Bank of Philadelphia for more accurate information on the trends of production, employment, and purchasing power in the Philadelphia Federal Reserve District. Such current information, reflecting the rate of business activity in the district, not only constitutes an important guide to the Federal Reserve Bank in the determination of its credit policy, but also is useful to the member banks and to the business firms of the district in the planning and execution of their operations. For some years prior to 1923 monthly reports from wholesale and retail merchants and from savings and commercial banks had been collected by the Bank, but no comprehensive figures on employment and wage payments in manufacturing industries, which are the backbone of this region, were available.

Early in 1923 the Federal Reserve Bank, in collaboration with the Department of Labor and Industry of the Commonwealth, invited the factory employers of Pennsylvania to cooperate in the collection of monthly data on employment and wages. Since that time the survey has been extended to include many additional firms, several new factory industries and representation from wholesale and retail trades. In the past year data have also been obtained to cover the operations of the anthracite mining, construction and transportation industries, so that monthly records covering several years are now available for practically all of the chief occupations of the state.

This study has been stimulated by a desire to discover and present the facts contained in the employment data in such a way as to provide indexes which give a continuous measurement of the changing levels of employment and payrolls in this region and in particular industries of the state. The result of this effort, if successful, should be of significance to students of business conditions and social and economic investigators in Pennsylvania,

as well as in other industrial areas of the country, for the underlying methods described in this thesis, it is believed, are flexible enough to be applied to the analysis of similar data in other regions.

As the factual basis for this report consists almost entirely of the 70,000 separate reports received from employers of labor in Pennsylvania, grateful acknowledgment is made to the 1,200 firms of the state whose generous cooperation has made the study possible. To Mr. Richard L. Austin, Chairman of the Board and Federal Reserve Agent of the Federal Reserve Bank of Philadelphia, I am deeply indebted for his generous counsel and encouragement in pursuing this study. My appreciation cannot adequately be expressed to Mr. Casimir A. Sienkiewicz, of the Federal Reserve Bank, who has read and criticized this manuscript; to Professors Joseph H. Willits, Alfred H. Williams and Miss Anne Bezanson, of the University of Pennsylvania, whose advice and suggestions have been of great value. It is also impossible for me to acknowledge in full measure my gratitude to Miss Helen M. Conine for her capable and faithful assistance, and to Mrs. Rhea D. Johnson and the other members of the research staff of the Federal Reserve Bank, upon whom fell much of the tiresome work of checking, recording, and compiling the thousands of individual reports.

To Mr. Charles A. Waters, Secretary of Labor and Industry of the Commonwealth of Pennsylvania, to Dr. Royal Meeker and Mr. Richard H. Lansburgh, who formerly served in the same capacity, and to Mr. William J. Maguire, Director of the Bureau of Statistics, I am deeply grateful for the constant and courteous cooperation which has always been extended by the Department of Labor and Industry.

As the planning of the survey, supervision of the work of collecting and organizing the data, and the construction and analysis of the indexes described in this report have been solely my responsibility, any errors and defects in the treatment of the subject must be assignable to me.

J. F. D.

Philadelphia, June 1, 1928.

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CHAPTER I

Employment as a Measure of Economic Conditions

A measure of changes in the volume of industrial employment affords one of the most significant and useful indicators of economic and social conditions in a highly industrialized state like Pennsylvania. The laborer occupies the dual position of producer and consumer. He is essential to industry not only as a primary agent in the production of goods, but as the consumer of the goods which he produces. When labor is fully employed goods are being produced in large quantities, while the heavy payroll disbursements in such a period of productive activity furnish a large part of the "consumer demand" which removes these goods from the market. Reductions in the volume of employment and payroll disbursements, on the other hand, indicate a slackening of industrial output and a curtailment of consumer buying. Fluctuations in the level of employment and of wage payments thus accompany and reflect variations both in productive activity and in purchasing power.

The usefulness of employment data, as an indicator of such changes in business conditions, is considerably enhanced by the fact that the number of workers employed is a physical rather than a pecuniary measure which is, in a sense, a common denominator of business, making possible comparisons between different kinds of industries and occupations and different localities.

Employment figures also furnish an indication of the relative "ease" or "tightness" of the labor market for, over short periods of time, the supply of labor available to any one industry or region is relatively immobile, and hence comparatively limited in amount. A rapid and great increase in employment to exceptionally high levels, especially when accompanied by relatively larger increases in payrolls, in overtime work, and in turnover, is an indication that the readily available supply of labor is becoming fully em-

ployed. A reversal of this upward trend, on the contrary, shows increasing "ease" in the labor market and a larger number of unemployed workers.

Currently available data on the volume of employment can also be of considerable assistance in coping with the recurrent problem of unemployment. The need for some adequate indication of the extent of unemployment became strikingly apparent during the acute depression of 1921 when the President's Conference on Unemployment was called for the purpose of surveying the labor situation. After consideration of all the evidence then available the Conference was unwilling to announce a closer estimate than that the number of unemployed in the country was somewhere between 3,500,000 and 5,500,000.* For obvious reasons, an employment index, however accurate it may be, cannot measure the amount of unemployment at any one time. But by indicating the changes in the number of workers on the rolls of reporting establishments, such an index, if embracing the principal occupations, can furnish an approximate indication of changes in the number of unemployed.

The measurement and study of employment fluctuations therefore possess considerably more than an academic value. Such data enable the business man to compare the activity of his own establishment with that of the entire industry or of the community in which his plant is located, to appraise conditions in competing industries and in other industries which serve as a source of his raw materials or as a market for his products, and to evaluate the condition of the labor market. Employment data, especially when supplemented by payroll figures, serve the sales manager as a guide to changes in purchasing power in the various regions or communities in which his goods are distributed. To social agencies and to public officials, a knowledge of changes in the volume of employment is helpful in estimating the numbers of unemployed and in need of relief. Economists and research workers find in these figures a faithful record of the changes in economic conditions which have been characterized as the "business cycle."

* *Report of the President's Conference on Unemployment,* p. 19; 1921, Government Printing Office, Washington.

The special usefulness of a continuous record of industrial employment to a public agency such as the Department of Labor and Industry is apparent. Employment statistics are a valuable guide to the Department in the operation of the state-wide system of public employment offices, since they help to indicate the condition of the labor market in various industries and regions. In the administration of labor laws, such as the industrial accident regulations, a knowledge of the fluctuations in employment is necessary for the understanding and interpretation of accident rates in various industries. An increase in the number of accidents in a certain industry, for instance, may result, not from increased hazards, but merely from the employment of more workers in that industry. Exposure to accidents, however, cannot be measured accurately by employment figures alone since they give no indication of the amount of overtime or part-time work, which increases or decreases the employe-hour exposure. Payroll data serve as a valuable supplement to employment figures in furnishing an indication of overtime and part-time work, but a record of changes in employe-hours worked provides the only accurate measure of actual employment and actual accident exposure.

The Federal reserve system, in discharging its responsibility for the "proper adjustment of the supply of credit to the needs of industry and commerce," must of necessity be continuously informed of the condition of business in the several districts. Information is needed, not only on the volume and character of outstanding bank loans and on other aspects of bank operations, but also on physical production and distribution of goods, on changes in the price level and the volume of trade, on retail buying and purchasing power. To be most useful such information should be available not only as a composite index of business activity in the district as a whole, but also for each of the leading industries and trades, and for the principal communities in the district. A reliable record of employment and of payroll disbursements is a necessary part of such a picture of business conditions, since it gives some indication both of purchasing power and productive activity, and it is available on a comparable basis for various industries and communities.

Industrial Character of Pennsylvania

Pennsylvania's great industrial importance and the unusual diversity of its industries make it probable that an index of employment in the state would reflect national as well as local conditions. Although one of the smaller states in area, and containing only eight per cent of the country's population, the factories and mines of the state normally produce almost 12 per cent of the national output and employ nearly one and a half million of the ten million persons engaged in these industries. Pennsylvania ranks first among the states in mining and second only to New York in manufacturing.

TABLE I

Wage Earners Employed in Leading Manufacturing Industries*

Industries	Number of wage earners	Per cent of total in State	Per cent of total in industry	Rank of Penna.
Steel works and rolling mills	147,108	14.7	39.7	1st
Foundries and machine shops	64,907	6.5	16.3	1st
Steam railroad repair shops	61,221	6.1	14.4	1st
Silk manufactures	60,809	6.1	40.9	1st
Knit goods	50,430	5.0	26.9	1st
Electrical machinery and apparatus	35,763	3.6	14.9	2nd
Cigars and cigarettes	29,413	2.9	25.1	1st
Bread and bakery products	19,911	2.0	12.1	2nd
Glass	19,275	1.9	27.8	1st
Clay products	17,233	1.7	16.9	1st

* Census of Manufactures: 1925. *Statistics for Industries, States and Cities.*

In the manufacturing industries, which are the economic backbone of Pennsylvania, nearly one million wage earners, or 40 per cent of the working population, are engaged. Among the factory industries a wide diversity exists, 311 of the 336 manufacturing industries of the United States listed in the 1923 Census of Manufactures being represented. Pennsylvania holds first rank among the states in the manufacture of iron and steel, locomotives, leather, coke, cement, clay products, glass, foundry and machine shop products, knit goods, silk, rayon, ice cream,

hats, and many other less important products, and ranks second in the manufacture of as many other products.

In spite of the fact that Pennsylvania holds first place as an industrial state, its manufacturing is so widely diversified that its largest industry—steel works and rolling mills—is the only one which employs more than seven per cent of the total number of factory workers. The proportion which the employment in each of the ten most important industries is of the total number of wage earners in Pennsylvania and of the total number of workers engaged in that industry in the United States is shown in Table I.

In the mining industries, Pennsylvania easily holds first position among the states, as they normally employ well over 300,000 workers, or more than a third of the national total. These constitute, however, less than 14 per cent of the working population, or about a third as many as are engaged in manufacturing. Anthracite and bituminous coal are by far the most important minerals, practically the entire national output of the former, and 26 per cent of the production of the latter being produced in Pennsylvania. The anthracite mines, which employ about 160,000 workers, are concentrated in a small area in northeastern Pennsylvania, while the bituminous fields, in which nearly as many workers are usually engaged, are located in Cambria and other western counties. Slate and stone quarrying and the extraction of natural gas and petroleum are the only other important extractive industries in the state, but these employ in the aggregate only 27,000 workers, or less than eight per cent of the total number engaged in mining.

The construction industry employs about the same proportion of the state's working population as it does in the United States as a whole. Although accurate data have not been available since 1920, it is probable that somewhere in the neighborhood of 270,000 workers are engaged in this industry.

Steam railroads, street railways, telephone and telegraph companies and other transportation and communication industries employ about a quarter of a million workers, or less than 10 per cent of the total number of wage earners in the state.

Employment in retail and wholesale trade and other distributive occupations is somewhat difficult to estimate since there has probably been an unusually rapid growth of these types of business since 1920 when the last Census of Occupations was taken. In that year 339,000 persons, of whom some 200,000 were of the wage earning class, were reported as enaged in mercantile pursuits. Owing to the rapid growth of the automobile business and other branches of distribution since that year, it is estimated that this latter number had increased to approximately 250,000 by 1925.

Scope of Employment Survey

The recognized need for current information on employment and payrolls in Pennsylvania led the Federal Reserve Bank of Philadelphia and the Department of Labor and Industry of the Commonwealth of Pennsylvania to invite the cooperation of several hundred manufacturing establishments throughout the state in the collection and compilation of monthly employment figures. Since 1923, when the collection of manufacturing figures was commenced, the survey has been extended to secure a more representative proportion of factory industries. Similar information has since been obtained from anthracite mining companies, street railways, steam railroads, retail and wholesale establishments, building contractors, and other branches of trade and industry, so that information is now available for the preparation of index numbers of employment and wages in most of the leading occupations of the state.

At the outset of this study it was recognized that certain considerations of a practical nature would have to limit and control the character of the survey. Inasmuch as the information to be collected was to serve a variety of needs, a "general purpose" index was desired. Such an index, to possess the greatest value, should be adequately indicative of employment changes in the important industries and localities of the state, as well as useful in furnishing some indication of changes in productive activity and purchasing power.

Of primary importance in a monthly index of this character is the necessity of having the current changes available for publication within a few days after the end of each month. Because of this consideration and for reasons of economy, reports from only a very small proportion of the thousands of establishments in the state could be included. Anything in the nature of a monthly census of the more than 17,000 manufacturing plants and the many thousand other types of establishments in the state would be prohibitive in cost, and by delaying the publication of current figures, would defeat the main purpose of the survey. For these reasons, the number of employers from whom reports have been obtained has been limited to less than a thousand, selected, so far as possible, to give adequate representation to the more important industrial activities in the various sections of the state. The cooperation of reporting firms has of course been entirely voluntary on their part, and the individual figures so furnished are kept in strict confidence.

The occupations now represented in the employment indexes include manufacturing, anthracite mining, construction, transportation, and trade, employing in the aggregate about three-fourths of the state's wage earning population. The only important productive occupations not now included are bituminous coal mining, in which labor difficulties and unsettled conditions prevented the collection of figures, and agriculture, which is to a great extent non-commercial in character and conducted on such a small scale (170,000 farmers employ only 100,000 wage earners) as to make the collection of representative data impracticable. No attempt was made to include wage earners engaged in professional, personal and public service, as these occupations are not commercial or industrial in character and would not be representative of business fluctuations.

This study is an attempt to describe the sources of data utilized, the methods used in the collection and analysis of information and in the preparation of indexes, and to analyze the fluctuations of employment and payrolls in Pennsylvania during the past seven

years. The record presented constitutes a background for the interpretation of current information which will be published each month in *The Business Review* of the Federal Reserve Bank of Philadelphia and in *Labor and Industry,* the monthly bulletin of the Department of Labor and Industry.

CHAPTER II

Collection and Organization of Information

Nature and Sources of Information

Most of the information which constitutes the basis for the construction of index numbers of employment and payrolls in Pennsylvania has been collected at monthly intervals over the past five years directly from the individual establishments. Early in 1923, the Federal Reserve Bank of Philadelphia, recognizing the need for more comprehensive current information on industrial conditions, invited several hundred manufacturing establishments in the Philadelphia Federal Reserve District to cooperate in the collection and publication of monthly employment data. Later in the same year, arrangements were made with the Pennsylvania and New Jersey departments of labor to extend this monthly survey to include the states of Pennsylvania and New Jersey in their entirety, and nearly all of the new establishments which commenced reporting at this time furnished monthly records back to January, 1923. At the same time as the industrial list was extended the Bank commenced the collection of employment records from 128 retail and wholesale establishments which had formerly been reporting data on sales and other items of their operation.

Again, in 1925, the list of reporting industrial establishments in Pennsylvania was extended in order to provide a better geographical distribution, so that monthly comparisons could be made for the more important cities. Many of the 129 firms added at this time provided earlier figures to complete their records back to 1923.

The Department of Labor and Industry of Pennsylvania, which had been cooperating with the Federal Reserve Bank, in January, 1926, commenced to collect monthly information from 32 building and contracting firms in the state, which have continued to report since that time.

In 1927 the scope of this monthly survey was again extended by securing employment and wage records, in some cases back to 1921, from the largest street railways and telephone company operating in the state, while through the Interstate Commerce Commission, similar information was obtained for the principal steam railroad systems. The scope of manufacturing data was further enlarged at this time by the addition of new plants and new industries.

TABLE II

SOURCES AND SCOPE OF INFORMATION ON EMPLOYMENT AND WAGES

Collecting agency and industry	No. of monthly reports	Information	Period covered
FEDERAL RESERVE BANK:			
Manufacturing	54,602	Employment and wages	Jan., 1923–Dec., 1927
Retail trade	3,071	Employment	Aug., 1923–Dec., 1927
Wholesale trade	5,381	Employment	Aug., 1923–Dec., 1927
Electric railways	197	Employment and wages	Jan., 1921–Dec., 1927
Telephone	84	Employment and wages	Jan., 1921–Dec., 1927
DEPARTMENT OF LABOR AND INDUSTRY:			
Construction	768	Employment and wages	Jan., 1926–Dec., 1927
ANTHRACITE BUREAU OF INFORMATION:			
Anthracite mining	1,682	Employment and wages	Jan., 1921–Dec., 1927
INTERSTATE COMMERCE COMMISSION:			
Steam railroads	234	Employment and wages	July, 1921–Dec., 1927
Railroad repair shops	234	Employment and wages	July, 1921–Dec., 1927
U. S. EMPLOYMENT SERVICE:			
Manufacturing	2,928	Employment	Jan., 1921–Dec., 1922

The generous cooperation of the Anthracite Bureau of Information with the Federal Reserve Bank, at this time, resulted in another valuable addition to the employment records already available. Twenty of the leading anthracite operators, producing a large percentage of the total tonnage, provided the Bureau with monthly records of employment and wages back to January, 1921,

while these and a number of other large companies agreed to report regularly in the future.

The United States Employment Service, which had collected monthly information on factory employment for Pennsylvania from 1921 to 1923, kindly furnished the Federal Reserve Bank with unpublished portions of these data, thus making available a continuous record of factory employment from 1921 to date.

In the aggregate, 69,181 separate monthly reports from some 1,200 individual employers of labor in the state have been analyzed and compiled in the attempt to present a comprehensive record of fluctuations in employment and payrolls in Pennsylvania during the past seven years. The sources of information which have been used in this survey and the nature and extent of the primary data obtained have been summarized in Table II.

Collection and Analysis of Data

Manufacturing industries

Since manufacturing is by far the most important occupation in Pennsylvania, employing more workers than are engaged in all other industrial and commercial activities, it was especially desired that accurate and comprehensive information be obtained from these industries. It was recognized that certain general desiderata must control the selection of reporting establishments in order that a small "sample" of less than a thousand firms would adequately reflect employment changes in the 17,000 manufacturing plants and more than 300 separate industries operating in the state. The industries and establishments included in the survey were, therefore, selected with the object of securing:

1. An adequate number and variety of industries, including both those which are large employers of labor and those the operations of which have a special significance in the interpretation of business conditions.
2. A representative proportion of the total number of wage earners engaged in each industry and in manufacturing as a whole.
3. Wide geographic distribution of reporting establishments so as to

provide representation to all parts of the state and to make possible the publishing of separate comparisons for cities.

4. Adequate representation to both large and small establishments in the various industries.

As it was recognized that the voluntary cooperation of a large number of firms, many of them already burdened with similar requests, was necessary to the success of such a monthly survey, the accompanying questionnaire* was finally selected as one that would meet the minimum need for information and ensure an adequate number of replies. It is similar in form to that used by the United States Bureau of Labor Statistics and by state labor bureaus, asking for data covering the payroll period† in the month which seems to be least subject to the influence of holidays and shut-downs. The requested information was limited to factory wage earners only, office employes and other salaried and executive staff being excluded, since the former group is less stable and more quickly reflects changes in the plant's operations. The information on changes in wage rates was requested chiefly in order to furnish a means of readily checking and explaining any large and unusual changes in payroll figures.

The cooperation of the firms was solicited by letters addressed to the president or general manager, presenting the need for and advantages of a monthly survey of employment conditions in the principal industries of the state and requesting regular reports on this questionnaire. Follow-up letters were addressed to those firms which at first had failed to reply, and in many instances, personal interviews were necessary to secure the desired cooperation. As a result of these efforts about two-thirds of the solicited firms agreed to report data regularly, and the list has been maintained by frequent additions, in the neighborhood of 900 to 1,000 firms, with more than 300,000 employes.

*The third question, "Total employe-hours worked during payroll period, was first added in January, 1927.

†An attempt was made originally to secure average figures for the entire month, but this proved to be impracticable from the standpoint of the reporting establishments.

March, 1928 No.....

CONFIDENTIAL REPORT ON EMPLOYMENT AND WAGES

TO THE

FEDERAL RESERVE BANK OF PHILADELPHIA

AND THE

DEPARTMENT OF LABOR AND INDUSTRY, COMMONWEALTH OF PENNSYLVANIA

This form is to be used for reporting confidential information for your firm for the pay roll period ending *nearest the 15th day of March, 1928.* Please mail the *white copy* of this report in the enclosed addressed envelope at the earliest date possible.

1. Number of wage earners on pay roll.....
   (Do not include salaried executives and office employes.)

2. Total wages paid during pay roll period.....$.....
   (Do not include salaries of executives and office employes.)

3. Total employe-hours worked during pay roll period.....
   (The number of hours worked by each wage earner during the pay roll period should be added together to obtain this figure.)

4. Please check whether the answers to 2 and 3 above are for
   —one week .....
   —two weeks .....
   —four weeks .....
   —five weeks .....
   —half month .....
   —month .....

5. Have you made any change in wage rates since February 15, 1928? .....
   If so, please state:
   Per cent of increase..... Number of wage earners affected.....
   Per cent of decrease..... Number of wage earners affected.....

6. REMARKS: HAVE THERE BEEN ANY SPECIAL CIRCUMSTANCES such as strikes, shut-downs, or changes in working time which would affect the significance of your figures? If so, please note the same here:

.....

.....

Name of firm .....Signature .....

Location of plant .....Official title .....

Upon the return of each questionnaire, the report is checked for accuracy by comparison of the figures with those for other plants in the same industry and with the previous month's report for the same plant. If a large change or any inconsistency appears, particularly in the average per capita earnings, the firm is requested to explain the discrepancy or to supply corrected figures.

The final corrected figures, with the wage payments for those establishments with a payroll period longer than one week calculated to an equivalent weekly basis, are then transferred to separate permanent record cards maintained for each establishment.

The questionnaires, which are mailed to reporting establishments about the 15th of each month, are in most cases returned before the end of the month. The survey is "closed" for compilation by the 9th of the following month; the results are thus usually released for publication less than one month from the time the reporting forms were mailed to the firms and two weeks after the end of the month covered by the report.

In the past, the results of each monthly survey have been published in the form of a simple comparison showing totals of employment and wage payments for identical firms in each industry and city in two succeeding months and the percentages of change occurring between the two months. This comparison of each month with the preceding month furnished a satisfactory record of current changes but was unsuited to comparisons over a long period of time, as will be pointed out in the next chapter.

Adequacy of information from manufacturing industries

The comprehensiveness of the information collected from this comparatively small number of manufacturing establishments and its probable reliability fortunately can be tested by comparison with reports of the Census of Manufactures, which are now available biennially. Since the number of manufacturing establishments contributing information on employment was limited to less than a thousand of the many thousands in the state, great care was exercised to secure a "sample" which would be representative of conditions in each industry and throughout the state.

The wage earners employed by reporting establishments have

TABLE III

Industrial Distribution of Factory Employment

Group and industry	Average number of wage earners reported 1925	Average number of wage earners employed 1925	Per cent of total reported	Industries included; as classified by 1925 Census of Manufactures
MANUFACTURING INDUSTRIES	333,205	837,001	39.8	
METAL PRODUCTS	120,119	309,561	38.8	
Blast furnaces	3,579	7,964	44.9	Iron and steel: blast furnaces
Steel works and rolling mills	67,838	153,321	44.2	Iron and steel: steel works and rolling mills Wire, drawn from purchased bars or rods Tin plate and terneplate Iron and steel, wrought pipe, not made in rolling mills
Iron and steel forgings	2,953	4,341	68.0	Forgings, iron and steel, not made in rolling mills Iron and steel, nails and spikes not made in rolling mills Springs steel: Railway, vehicle, heavy machine, etc., not made in rolling mills
Structural iron-work	3,827	10,302	37.1	Structural and ornamental iron-work, not made in rolling mills
Steam and hot-water heating apparatus	5,267	8,561	61.5	Steam fittings and steam and hot-water heating apparatus Steam and other packing, pipe and boiler covering, and gaskets, not made in textile mills
Stoves and furnaces	1,077	2,817	38.2	Stoves, other than gas, oil and electric and warm-air furnaces
Foundries	8,868	27,086	32.7	Foundry and machine shop products, not elsewhere classified (in part)
Machinery and parts	7,871	33,785	23.3	Foundry and machine shop products, not elsewhere classified (in part) Textile machinery and parts Machine tools
Electrical apparatus	6,887	35,763	19.3	Electrical machinery: apparatus and supplies

TABLE III—*Continued*

INDUSTRIAL DISTRIBUTION OF FACTORY EMPLOYMENT

Group and industry	Average number of wage earners reported 1925	Average number of wage earners employed 1925	Per cent of total reported	Industries included; as classified by 1925 Census of Manufactures
Engines and pumps	3,364	7,141	47.1	Pumps (hand and power) and pumping equipment Engines and water wheels
Hardware and tools	7,847	14,773	53.1	Hardware, not elsewhere classified Tools, not including edge tools, machine tools, files or saws Cutlery (not including silver and plated cutlery) and edge tools Saws Bolts, nuts, washers and rivets, iron and steel, not made in rolling mills
Brass and bronze products	741	3,734	19.8	Brass, bronze and other non-ferrous alloys and manufactures of these and of copper, not specifically classified
TRANSPORTATION EQUIPMENT	77,789	104,576	74.4	
Automobiles	5,916	5,810	101.8	Motor vehicles, not including motorcycles
Automobile bodies and parts	3,917	13,119	29.9	Motor vehicle bodies and motor vehicle parts
Locomotives and cars	14,795	16,545	89.4	Locomotives, not made in railroad repair shops Cars, electric and steam railroad, not built in railroad repair shops
Railroad repair shops	49,373	64,977	76.0	Car and general construction and repairs, electric railroad repair shops Car and general construction and repair, steam railroad repair shops
Shipbuilding	3,788	4,125	91.8	Ship and boat building, steel and wooden, including repair work
TEXTILE PRODUCTS	55,662	206,195	27.0	
Cotton goods	4,046	11,523	35.1	Cotton goods
Woolens and worsteds	6,857	18,646	36.8	Woolen goods Worsted goods

TABLE III—*Continued*

INDUSTRIAL DISTRIBUTION OF FACTORY EMPLOYMENT

Group and industry	Average number of wage earners reported 1925	Average number of wage earners employed 1925	Per cent of total reported	Industries included; as classified by 1925 Census of Manufactures
Silk goods	17,666	60,809	29.1	Silk manufactures
Textile dyeing and finishing	1,719	8,271	20.8	Dyeing and finishing textiles
Carpets and rugs	3,277	10,079	32.5	Carpets and rugs, wool, other than rag Carpets and rugs, rag
Hats	4,362	5,190	84.0	Hats, fur felt Hats, wool felt
Hosiery	10,424	37,529	27.8	Hosiery
Knit goods, other	3,222	12,129	26.6	Knit underwear Knit cloth
Men's clothing	1,385	16,802	8.2	Clothing, men's, not elsewhere classified
Women's clothing	761	10,003	7.6	Clothing, women's, not elsewhere classified
Shirts and furnishings	1,943	15,214	12.8	Shirts Furnishing goods, men's, not elsewhere classified
FOODS AND TOBACCO	21,884	67,514	32.4	
Bread and bakery products	4,228	19,911	21.2	Bread and other bakery products
Confectionery	4,526	6,989	64.8	Confectionery
Ice cream	1,179	2,889	40.8	Ice cream
Meat packing	2,068	5,537	37.3	Slaughtering and meat packing, wholesale
Sugar refining	1,981	2,372	83.5	Sugar refining, cane
Cigars and tobacco	7,902	29,816	26.5	Tobacco, cigars and cigarettes Tobacco, chewing and smoking, and snuff

TABLE III—*Continued*

INDUSTRIAL DISTRIBUTION OF FACTORY EMPLOYMENT

Group and industry	Average number of wage earners reported 1925	Average number of wage earners employed 1925	Per cent of total reported	Industries included; as classified by 1925 Census of Manufactures
STONE, CLAY AND GLASS PRODUCTS	20,770	49,113	42.3	
Brick, tile and pottery	4,985	19,981	24.9	Clay products (other than pottery) and non-clay refractories Pottery, including porcelain ware
Cement	7,452	9,857	75.6	Cement
Glass	8,333	19,275	43.2	Glass
LUMBER PRODUCTS	6,306	23,219	27.2	
Lumber and planing mills	3,072	7,333	41.9	Lumber: Planing mill products not made in planing mills connected with saw mills
Furniture	2,626	12,321	21.3	Furniture
Wooden boxes	603	3,565	17.1	Boxes, wooden, except cigar boxes Boxes, cigar, wooden
CHEMICAL PRODUCTS	10,903	23,266	46.9	
Chemicals and drugs	1,198	7,226	16.6	Patent medicines and compounds Perfumery, cosmetics and toilet preparations Druggists' preparations Chemicals, not elsewhere classified Sulfuric, nitric and mixed acids Soap Alcohol, ethyl
Coke	2,460	3,500	70.3	Coke, not including gashouse coke (in part)
Explosives	426	1,505	28.3	Explosives Ammunition and related products
Paints and varnishes	762	3,079	24.7	Paints and varnishes Bone black, carbon black and lamp black
Petroleum refining	6,057	7,956	76.1	Petroleum refining

TABLE III—*Concluded*

INDUSTRIAL DISTRIBUTION OF FACTORY EMPLOYMENT

Group and industry	Average number of wage earners reported 1925	Average number of wage earners employed 1925	Per cent of total reported	Industries included; as classified by 1925 Census of Manufactures
LEATHER AND RUBBER PRODUCTS	11,234	24,653	45.6	
Leather tanning	5,338	8,534	62.5	Leather: Tanned, curried and finished
Shoes	4,400	11,438	38.5	Boots and shoes, other than rubber
Leather products, other	463	1,626	28.5	Leather goods, not elsewhere classified Gloves and mittens, leather Trunks, suit cases and bags
Rubber tires	1,033	3,055	33.8	Rubber tires and inner tubes
PAPER AND PRINTING	8,538	28,904	29.5	
Paper and wood pulp	4,143	9,574	43.3	Paper and wood pulp
Paper boxes and bags	690	6,313	10.9	Boxes, paper and other, not elsewhere classified Bags, paper, exclusive of those made in paper mills Envelopes
Printing and publishing	3,705	13,017	28.5	Printing and publishing, newspapers and periodicals

been classified into 52 industrial groups, as shown in Table III. These include 86 of the separate "industries" as classified by the 1925 Census of Manufactures. Every manufacturing industry in the state which, in 1925, employed more than 5,000 workers—one-half of one per cent of the total number engaged—is represented, as well as several of the smaller industries. These industries employed in that year 837,001 workers, or 84 per cent of the total number engaged in manufacturing. The reporting establishments employed 333,205 wage earners—40 per cent of those employed in the industries represented—and about a third of the total number employed in all manufacturing industries. This proportion is believed to be a sample which will furnish an adequate measure of employment fluctuations in manufacturing.*

Among the individual manufacturing industries, the representativeness of the samples obtained varies considerably. The size of the reporting sample ranges from more than 90 per cent of the total number employed in the shipbuilding and automobile industries to less than 10 per cent in the case of men's clothing and women's clothing. In the case of 23 of the 52 industries, however, the proportion ranges from 20 to 40 per cent of the total, and in only eight of the industries are less than one-fifth of the workers included. In most of the large and important industries the representation appears to be fairly satisfactory. Of the 26 larger industries—each employing more than 10,000 workers, or one per cent of the total number in the state—in only three is the representation less than one-sixth of the number employed. Repeated efforts were made to secure a better sample of reporting firms from this latter group—shirts and furnishings, men's clothing and women's clothing—but labor conditions or other considerations made many of the firms unwilling to cooperate. The sample available in these industries, as well as in a few others, is somewhat too small to be reliable, and it is hoped that a larger number of these firms will soon be included in the survey.

* "Probably one-third is a feasible proportion at which to aim, 40 per cent of the workers in any industry would appear to be in general an upper limit of the quota needed; and frequently a much smaller proportion may be found ample." R. G. Hurlin and W. A. Berridge, *Employment Statistics for the United States . . . Methods Recommended by the Committee on Governmental Labor Statistics of the American Statistical Association.*

An effort has been made in obtaining the primary data, also, to ensure a satisfactory representation for all parts of the state. Factory employers in every county were invited to cooperate, with the result that both the important and the less important industrial sections are well represented among the reporting manufacturing establishments. In consequence nearly all counties of the state are well represented in the survey, as shown in Table IV.

Since no county distribution was made in the latest Census of Manufactures, the figures in the fifth column of Table IV, showing the total number of wage earners engaged in manufacturing in each county, were estimated by assuming that the totals for each county reported in the Census of 1919 declined in the same proportion as did employment in the entire state between the years 1919 and 1925. The estimates arrived at by this method are believed to be sufficiently accurate for the purposes of this comparison. The figures in the fourth column show, for each county, the total of the average number of workers employed in 1925 by establishments reporting in that year.* The sixth column shows the percentage of the total number of wage earners in each county on the payrolls of reporting establishments, while the third and second columns show, respectively, the number of reporting plants and the number of industries represented in each county.

The table indicates a wide geographic distribution of employment in reporting establishments. Only 10 of the 67 counties in the state are without representation, and the total number of wage earners employed in all these counties is only 7,820, or less than one per cent of the total employed in the state. Most of the remaining counties are well represented in the index; in only four of these is the proportion reported less than 10 per cent of the total employment.

A fairly wide distribution of reporting plants and industries is also indicated, as, in all but six of the less important counties, two or more industries are represented.

* Data from railroad repair shops are obtained from reports to the Interstate Commerce Commission, and figures for individual establishments are not available. For that reason, employment figures reported in the *Pennsylvania Industrial Directory of 1924* were used in this table instead of 1925 averages.

TABLE IV

GEOGRAPHICAL DISTRIBUTION OF FACTORY EMPLOYMENT

Counties	Establishments reporting in 1925			Total number of wage earners	Per cent of total employed by reporting establishments
	Number of industries	Number of establishments	Number of wage earners		
Adams	3	4	442	1,795	24.6
Allegheny	27	69	61,933	152,722	40.6
Armstrong	2	3	2,087	4,296	48.6
Beaver	12	14	5,405	21,535	25.1
Bedford	1	1	20	1,236	1.6
Berks	29	52	19,977	36,140	55.3
Blair	9	16	12,176	17,575	69.3
Bradford	2	3	1,828	3,986	45.9
Bucks	4	5	1,245	13,275	9.4
Butler	2	2	630	5,986	10.5
Cambria	12	18	1,880	13,219	14.2
Cameron	1	2	105	870	12.1
Carbon	3	4	860	6,509	13.2
Center	3	4	244	1,747	14.0
Chester	12	15	4,046	11,053	36.6
Clarion	1	1	97	1,094	8.9
Clearfield	2	7	1,177	5,195	22.7
Clinton	2	4	1,570	5,197	30.2
Columbia	9	11	1,943	5,335	36.4
Crawford	3	3	370	3,296	11.2
Cumberland	11	17	3,319	3,774	87.9
Dauphin	16	29	8,584	20,912	41.0
Delaware	11	21	7,544	59,304	12.7
Elk	3	5	787	5,097	15.4
Erie	9	13	4,106	20,189	20.3
Fayette	7	8	1,422	10,073	14.1
Forest	0	0	0	965	0
Franklin	4	4	827	4,657	17.8
Fulton	0	0	0	68	0
Greene	2	2	217	402	54.0
Huntingdon	2	2	66	3,178	2.1
Indiana	2	3	830	2,059	40.3
Jefferson	3	3	1,202	2,290	52.5
Juniata	1	1	103	577	17.9
Lackawanna	15	27	5,005	18,588	26.9
Lancaster	24	33	5,327	20,758	25.7
Lawrence	4	4	2,636	17,888	14.7
Lebanon	8	13	2,244	8,866	25.3
Lehigh	25	45	13,824	21,308	64.9
Luzerne	19	34	10,338	21,872	47.3

TABLE IV—*Concluded*

GEOGRAPHICAL DISTRIBUTION OF FACTORY EMPLOYMENT

Counties	Establishments reporting in 1925			Total number of wage earners	Per cent of total employed by reporting establishments
	Number of industries	Number of establishments	Number of wage earners		
Lycoming	18	27	6,369	10,630	59.9
McKean	5	5	1,451	4,768	30.4
Mercer	9	14	5,372	13,811	38.9
Mifflin	4	4	2,364	4,327	54.6
Monroe	0	0	0	1,760	0
Montgomery	20	26	8,457	25,148	33.6
Montour	2	2	266	1,440	18.5
Northampton	16	37	9,254	28,753	32.2
Northumberland	10	16	8,806	10,091	87.3
Perry	0	0	0	873	0
Philadelphia	50	244	84,061	247,353	34.0
Pike	0	0	0	153	0
Potter	1	1	251	1,785	14.1
Schuylkill	13	23	3,734	10,612	35.2
Snyder	0	0	0	691	0
Somerset	0	0	0	697	0
Sullivan	0	0	0	356	0
Susquehanna	0	0	0	1,808	0
Tioga	1	1	379	1,560	24.3
Union	3	3	291	856	34.0
Venango	2	4	1,818	5,380	33.8
Warren	2	2	151	3,935	3.8
Washington	4	10	7,146	13,982	51.1
Wayne	5	6	825	2,159	38.2
Westmoreland	7	14	7,351	27,336	26.9
Wyoming	0	0	0	449	0
York	24	50	7,501	23,861	31.4

In addition to the necessity of having a sufficient proportion of the total employment and widespread geographic distribution of reporting establishments, an adequate sample should include the reports of both large and small establishments. A claim has been advanced to the effect that the very large factories tend to experience a wider cyclical fluctuation in operations, and hence in employment, than do the smaller establishments.* If this be true, a sample consisting entirely of large establishments might

* W. I. King: *Employment Hours and Earnings in Prosperity and Depression,* National Bureau of Economic Research, 1923; pp. 48-54.

tend to overstate the extent of both the upward and downward changes of employment, and might, therefore, be not entirely reliable as an indicator of the amount of change in the employment level. This conclusion is open to some doubt, however. An analysis of reports from Pennsylvania industries shows that there is no wide divergence between the fluctuations of large and small establishments, as will be shown later.*

Nevertheless, the desirability of securing reports from a substantial number of small plants was recognized, and a fair representation of these has been obtained. It must be realized, however, that it is impracticable to obtain an ideal size distribution of reporting establishments. It is usually more difficult to obtain the cooperation of the smaller plants than the larger ones, as the former frequently have inadequate clerical staffs and insufficient records to provide the needed information. Moreover, to secure the present sample of 40 per cent of the total employment, with proportional representation being given to establishments of all sizes, would necessitate reports from 6,900 establishments—40 per cent of all those in the state. Of course, it was impossible to secure such a large number of returns, hence the present sample is more heavily weighted with the larger establishments. Table V shows the average number of workers per establishment for each industry as reported by the Census of Manufactures in 1925, compared with the average size of the factories from which figures were obtained in that year, as well as the percentages of the workers reported in each industry employed in plants of different size.† This tabulation indicates that practically 64 per cent of the total are employed in factories having more than 500 on their rolls, and less than 5 per cent are engaged in plants employing less than 100 workers.‡

* See Chart VIII.

† Unfortunately no 1925 census data are available with which to test the distribution of employes in plants of various size.

‡ The data for 1921 and 1922 were collected by the United States Employment Service from 122 establishments in Philadelphia, Pittsburgh, Reading and Johnstown, employing over 200,000 workers. Since practically all of these were very large establishments and were located only in the above four cities, they probably do not constitute an entirely reliable sample of employment conditions in manufacturing industries throughout the state.

TABLE V

Distribution of Factory Employment by Size of Reporting Establishment

Industries	Wage earners employed by reporting establishments in 1925						Average number per establishment—Census of 1925
	Average number per industry	Per cent of total number employed in plants having—				Average number per establishment	
		1–50 wage earners	51–100 wage earners	101–500 wage earners	Over 500 wage earners		
ALL MANUFACTURING	333,205	1.8	2.9	31.8	63.5	361	81
METAL PRODUCTS	120,119	.8	1.7	27.9	69.6	490	210
Blast furnaces	3,579	5.0	0	38.2	56.8	325	221
Steel works and rolling mills	67,838	.1	.3	7.4	92.2	1,305	816
Iron and steel forgings	2,953	4.7	4.7	52.0	38.6	246	72
Structural iron works	3,827	.9	1.5	32.7	64.9	383	90
Steam and hot-water heating apparatus	5,267	.2	1.7	69.4	28.7	310	119
Stoves and furnaces	1,077	0	17.0	83.0	0	120	78
Foundries	8,868	2.1	8.3	58.7	30.9	211	119
Machinery and parts	7,871	.9	3.6	82.4	13.1	213	110
Electrical apparatus	6,887	1.1	2.5	28.6	67.8	383	269
Engines and pumps	3,364	0	2.3	51.7	46.0	336	198
Hardware and tools	7,847	1.8	0	41.9	56.3	436	94
Brass and bronze products	741	14.4	13.4	72.2	0	82	35
TRANSPORTATION EQUIPMENT	77,789	1.6	1.1	13.4	83.9	508	270
Automobiles	5,916	1.3	0	3.0	95.7	986	323
Automobile bodies and parts	3,917	2.2	0	41.1	56.7	301	127
Locomotives and cars	14,795	.3	.4	12.2	87.1	1,138	973
Railroad repair shops	49,373	2.1	1.7	13.7	82.5	422	281
Shipbuilding	3,788	.8	0	0	99.2	947	217

TABLE V—*Continued*

DISTRIBUTION OF FACTORY EMPLOYMENT BY SIZE OF REPORTING ESTABLISHMENT

Industries	Wage earners employed by reporting establishments in 1925						Average number per establishment —Census of 1925
	Average number per industry	Per cent of total number employed in plants having—				Average number per establishment	
		1–50 wage earners	51–100 wage earners	101–500 wage earners	Over 500 wage earners		
TEXTILE PRODUCTS	55,662	1.6	4.0	41.4	53.0	320	84
Cotton goods	4,046	2.2	8.9	41.7	47.2	289	100
Woolens and worsteds	6,857	0	2.9	40.7	56.4	343	109
Silk goods	17,666	1.3	1.3	32.6	64.8	421	129
Textile dyeing and finishing	1,719	3.8	4.9	91.3	0	172	56
Carpets and rugs	3,277	2.1	4.0	39.4	54.5	252	168
Hats	4,362	1.4	3.3	9.0	86.3	727	216
Hosiery	10,424	1.3	2.9	36.7	59.1	372	124
Knit goods, other	3,222	2.4	13.4	68.5	15.7	201	89
Men's clothing	1,385	4.3	8.0	46.0	41.7	154	37
Women's clothing	761	7.8	0	92.2	0	127	30
Shirts and furnishings	1,943	1.5	7.7	90.8	0	194	66
FOODS AND TOBACCO	21,884	4.3	6.6	47.6	41.5	226	22
Bread and bakery products	4,228	11.0	17.6	28.8	42.6	136	10
Confectionery	4,526	3.8	2.0	18.7	75.5	323	33
Ice cream	1,179	12.4	15.0	72.6	0	131	11
Meat packing	2,068	6.7	11.4	81.9	0	148	36
Sugar refining	1,981	0	0	0	100.0	991	791
Cigars and tobacco	7,902	1.2	3.4	65.8	29.6	293	54
STONE, CLAY AND GLASS PRODUCTS	20,770	.4	1.5	48.0	50.1	297	121
Brick, tile and pottery	4,985	.6	2.4	97.0	0	156	65
Cement	7,452	0	0	38.9	61.1	532	448
Glass	8,333	.8	2.5	31.6	65.1	347	257

TABLE V—*Concluded*

Distribution of Factory Employment by Size of Reporting Establishment

Industries	Wage earners employed by reporting establishments in 1925						Average number per establishment—Census of 1925
	Average number per industry	Per cent of total number employed in plants having—				Average number per establishment	
		1–50 wage earners	51–100 wage earners	101–500 wage earners	Over 500 wage earners		
LUMBER PRODUCTS	6,306	8.2	10.7	51.6	29.5	154	28
Lumber and planing mills	3,072	9.7	8.7	20.3	61.3	219	16
Furniture	2,626	6.1	13.0	80.9	0	125	45
Wooden boxes	608	9.3	10.6	80.1	0	101	36
CHEMICAL PRODUCTS	10,903	3.8	3.0	26.3	66.9	280	45
Chemicals and drugs	1,198	19.4	19.8	60.8	0	60	26
Coke	2,460	0	0	19.8	80.2	820	78
Explosives	426	13.1	0	86.9	0	142	52
Paints and varnishes	762	11.5	0	88.5	0	95	28
Petroleum refining	6,057	0	.9	7.7	91.4	1,211	156
LEATHER AND RUBBER PRODUCTS	11,234	1.8	6.4	67.4	24.4	212	91
Leather tanning	5,338	.2	3.2	63.8	32.8	297	119
Shoes	4,400	3.1	6.0	80.2	10.7	176	105
Leather products, other	463	5.5	37.0	57.5	0	77	21
Rubber tires and goods	1,033	1.9	9.1	34.1	54.9	258	278
PAPER AND PRINTING	8,538	7.1	8.3	47.4	37.2	167	32
Paper and wood pulp	4,143	.2	4.8	35.5	59.5	345	162
Paper boxes and bags	690	6.0	43.3	50.7	0	115	39
Printing and publishing	3,705	14.7	6.8	59.7	18.8	112	19

Anthracite industry

Anthracite mining is the most important single industry in Pennsylvania, employing more workers than the steel industry—the largest employer of factory labor—and one-sixth as many as the total number engaged in manufacturing. Moreover, the industry is highly localized in a few counties in the northeastern part of the state, where the producing fields occupy an area of only 500 square miles. The industry is thus of predominant economic importance to this region, where the prosperity of most of the people and industries depends largely upon the activity of the mines.

It has been particularly fortunate, therefore, that a considerable number of the larger anthracite operators have recently made available monthly records of employment and wages in their collieries, in most cases as far back as January, 1921.

The cooperating establishments report their data each month to the Anthracite Bureau of Information on individual questionnaires modeled after those used by the Bank in the collection of manufacturing data, and duplicate copies of these reports* are then furnished to the Bank for analysis and publication of the results. These reports are checked for accuracy, as in the case of manufacturing establishments, and totals are compiled and released for publication each month.

Reports on number of wage earners and amount of payrolls have been received from 27 establishments, employing 54 per cent of the total number of wage earners engaged in the industry. All of these establishments were able to furnish monthly data as far back as 1925; prior to that time from 40 to 50 per cent of the industry was represented. This large proportion should furnish an excellent reflection of conditions throughout the industry, although the sample, as in the case of manufacturing, is somewhat overweighted with the larger collieries. The distribution of workers in establishments of various size and in the three mining fields, compared with Census data† for all collieries in the industry, is

* These duplicate copies are designated by code number to avoid disclosing the name of reporting establishments.

† Data from 1919 Census of Mines and Quarries were used in this comparison and are believed to be sufficiently representative of more recent conditions; later census data are not available for mining industries.

TABLE VI

DISTRIBUTION OF ANTHRACITE WORKERS BY SIZE OF ESTABLISHMENT AND BY MINING FIELDS

Size groups and mining fields	Reporting establishments		All establishments	
	Number of wage earners	Per cent of total	Number of wage earners	Per cent of total
In establishments with—				
1– 100 workers	0	0	1,428	1.0
101– 500 workers	1,914	2.2	18,240	12.4
501–1,000 workers	6,434	7.5	21,804	14.9
Over 1,000 workers	77,733	90.3	105,110	71.7
TOTALS	86,081	100.0	146,582	100.0
Wyoming field	52,322	60.8	83,723	57.1
Lehigh field	15,340	17.8	19,356	13.2
Schuylkill field	18,389	21.4	43,503	29.7

shown in Table VI. The very small establishments, with less than 100 workers, are entirely unrepresented among reporting establishments, while reporting collieries employing from 101 to 1,000 workers employ about 10 per cent of the total, with 27 per cent in establishments of this size for the entire industry. This in part accounts for the fact that the southern, or Schuylkill, mining field is somewhat under-represented by the survey, as most of the smaller establishments are operating in this field. In spite of this slight overweighting of the two northern mining fields, and of the larger establishments, the reporting collieries employ such a large proportion of the wage earners in the industry that this sample is considered to be adequately representative.

Retail and wholesale trade

For some years prior to 1923, when the employment survey was commenced, the Federal Reserve Bank had been receiving monthly reports on sales and accounts from over 200 retail and wholesale firms in the Philadelphia Federal Reserve District. In August, 1923, these establishments were asked to report employment data as well, and since that time, figures have been furnished by about 160 firms in Pennsylvania. The retail firms include shoe, men's and women's apparel, furniture and department,

and dry goods stores; while the wholesale trade includes dealers in drugs, dry goods, shoes, electrical supplies, hardware, jewelry, groceries, and paper.

The average employment of reporting retail stores in 1925 was 21,816, or about 17 per cent of the estimated number of workers employed in the trades represented, and the wholesale firms included in the survey employed 4,934, or 12 per cent of the total number engaged in the state. About half of the reporting retailers, and three-fourths of the wholesale dealers, had less than 50 workers on their rolls; while the share of the total employed by these small establishments was only 3 per cent, in the case of retail trade, and 36 per cent for wholesale. It is impossible to determine whether these samples give adequate representation to firms of different size in retail and wholesale trade,* but it seems probable that, as in the case of manufacturing and mining, a relatively small proportion of the very small establishments are included.

The geographic distribution of reporting retail and wholesale firms is deficient in that no reports are received from the extreme western part of Pennsylvania, which is not included in the Philadelphia Federal Reserve District. Table VII shows the percentage of the total number of workers employed by retail, and by wholesale establishments, in each of the counties in which these establishments were located. Philadelphia is of predominant importance in both wholesale and retail trade, with about two-thirds of the total number employed by firms in this city. Although this undoubtedly indicates some overweighting of the sample with Philadelphia firms, the disproportion is not as great as it first appears, for about 45 per cent of the wholesale and 30 per cent of the retail business of the state is done by Philadelphia firms.†

Construction industry

Considerable difficulty is encountered in obtaining employment reports from a sufficient number of establishments in the construction industries owing to the extreme seasonality of operations,

* No census figures are available for mercantile business in Pennsylvania.

† *Report on Productive Industries, Railways, Taxes, Assessments, Waterways and Miscellaneous Statistics* of the Commonwealth of Pennsylvania, 1924; p. 741.

TABLE VII

GEOGRAPHICAL DISTRIBUTION OF EMPLOYMENT IN RETAIL AND WHOLESALE TRADE AND CONSTRUCTION

(Per cent of total in each county)

Counties	Retail	Wholesale	Construction
TOTAL	100.0	100.0	100.0
Allegheny	0	0	23.7
Bedford	0	.3	0
Berks	6.6	5.2	1.5
Blair	2.0	1.2	0
Bucks	.1	0	0
Cambria	3.5	4.2	1.1
Chester	0	.6	0
Clearfield	0	.7	0
Dauphin	3.9	1.7	0
Delaware	*	.2	0
Erie	0	0	4.8
Franklin	*	.5	0
Lackawanna	2.4	3.5	2.3
Lancaster	1.2	1.2	1.3
Lebanon	.1	0	0
Lehigh	4.1	5.3	2.3
Luzerne	2.5	3.8	8.5
Lycoming	.2	0	0
McKean	0	1.1	0
Monroe	.3	0	0
Montgomery	0	.4	2.0
Northampton	1.9	3.9	6.3
Northumberland	.1	.7	2.5
Philadelphia	69.4	63.6	43.1
Schuylkill	.7	.4	0
Westmoreland	0	0	.6
York	1.0	1.5	0

* Less than .1 per cent.

the small scale of establishments and the mobility of labor in these industries. Only the larger firms retain even a skeleton organization throughout the year; the smaller contractors and sub-contractors build up their working forces during the active building season and discharge all or most of their workers in the winter months.

The Department of Labor and Industry, however, has been

successful in securing regular monthly reports on employment and payrolls from a number of the larger and more stable building and contracting firms in the state. Since January, 1926, between 30 and 40 firms have reported data, and for 32 of these firms, with an average of 6,727 wage earners in 1926, continuous records are available. The information is collected on questionnaires identical with those used for manufacturing industries and has been compiled and published in the same manner. Although this sample constitutes less than three per cent of the total number of wage earners engaged in the building trades, it probably reflects conditions among a much larger proportion of the workers, as many of these large firms issue a considerable amount of sub-contracting business to the smaller operators. The geographic distribution of the workers employed by these reporting establishments is shown in Table VII. Philadelphia and Allegheny counties, which include the two largest construction centers of the state, employ about two-thirds of the total number, while the remainder are widely distributed in 11 other counties.

Transportation industries

This group of industries, which employs in the aggregate some 250,000 wage earners, or one-fourth as many as are engaged in manufacturing, includes the operation of steam railroads, electric railways, and other means of transportation proper, as well as telephone and telegraph systems and a number of other minor activities.

Monthly data on employment and wages, extending back to 1921, are now available for the three principal industries in this group: steam railroads, electric street railways and the telephone industry. The street railway companies operating in Philadelphia, Pittsburgh, Scranton, and Erie have furnished the Bank with separate records for their systems, and the Bell Telephone Company of Pennsylvania has provided similar information on the operations of all the companies within the state included in the Bell System. Monthly records of employment and payrolls of three important steam railroad systems—the Pennsylvania, Reading, and Lehigh Valley—have been obtained from the public reports of these carriers to the Interstate Commerce Commission.

TABLE VIII

Reporting Establishments and Wage Earners

(Average number for each year)

Industry and occupation	1921		1922		1923		1924		1925		1926		1927	
	Firms	Wage earners	Firms	Wage earners	Firms	Wage earners	Firms	Wage earners	Firms	Wage earners	Firms	Wage earners	Firms	Wage earners
ALL INDUSTRIES	146	312,539	148	332,066	1,014	529,909	1,070	502,689	1,119	489,026	1,199	525,644	1,174	510,210
MANUFACTURING	*122	203,603	*122	220,627	856	354,439	879	320,549	923	333,205	968	345,192	943	321,630
Metal products	46	88,564	46	100,171	231	122,915	239	119,195	245	120,119	250	121,175	241	109,261
Transportation equipment	7	13,543	7	15,666	153	104,229	152	78,046	153	77,789	154	80,981	153	74,083
Textile products	29	25,869	29	27,975	175	54,863	176	49,061	174	55,662	176	57,566	173	57,011
Foods and tobacco	12	9,592	12	10,882	82	20,219	80	19,349	97	21,884	117	25,419	111	24,859
Stone, clay and glass products	5	2,613	5	3,165	54	15,156	67	19,256	70	20,770	71	21,203	67	19,860
Lumber products	2	1,229	2	1,440	35	5,569	35	5,590	41	6,306	47	6,023	45	5,255
Chemical products	6	7,069	6	6,862	32	10,813	35	10,392	39	10,903	42	12,393	45	11,502
Leather and rubber products	6	2,833	6	3,318	52	12,435	51	11,098	53	11,234	53	11,420	52	11,340
Paper and printing	3	5,041	3	5,308	42	8,240	44	8,562	51	8,538	58	9,012	56	8,459
ANTHRACITE MINING	20	69,246	20	42,391	24	76,869	24	81,725	25	57,055	27	74,485	27	86,793
CONSTRUCTION	—	—	—	—	—	—	—	—	—	—	32	6,076	32	4,647
TRANSPORTATION	4	39,690	6	69,048	6	77,540	6	74,516	7	72,016	7	72,796	7	70,138
Steam railroads	3	34,628	3	35,005	3	39,024	3	35,821	3	34,580	3	35,367	3	33,512
RETAIL TRADE	—	—	—	—	51	17,265	55	21,012	60	21,816	60	22,160	60	22,098
WHOLESALE TRADE	—	—	—	—	77	3,796	103	4,887	104	4,934	105	4,935	105	4,904

* These totals also include miscellaneous industries not included in separate groups.

These eight large companies employ over 70,000 workers, or nearly 30 per cent of the estimated total number of wage earners engaged in the transportation and communication industries of Pennsylvania. This sample should be quite adequate to furnish a substantially accurate measure of employment conditions in these industries.

The primary information available for measuring employment fluctuations in Pennsylvania since 1921 is summarized in Table VIII, which shows the number of reporting establishments furnishing data and the average number of workers employed by them for the years from 1921 to 1927. It is obvious, of course, that the scope of the survey, and hence its reliability, has increased considerably since 1921. The figures available for the earlier years, especially for 1921 and 1922, were probably not comprehensive enough to furnish an entirely adequate measure of employment conditions throughout the state. It is believed, however, that the present sample, consisting of reports from some 1,200 establishments employing more than half a million wage earners in Pennsylvania, should provide a satisfactory basis for the construction of index numbers which will be representative of employment conditions throughout the state.

CHAPTER III

Construction of Index Numbers

The preceding chapter has dealt with the sources of information and described the collection and organization of the basic data available. As was indicated, this information can be used in showing changes in employment and wages from month to month, by making a simple tabulation of the figures for an identical group of firms. Such monthly comparisons are inadequate, however, because they fail to measure changes from year to year. If a comparison with the corresponding month of the previous year is desired another similar tabulation must be made, using the figures reported by the same group of firms.

Obviously such a method of showing month to month or year to year changes, though widely used in presenting economic statistics, leaves much to be desired, both from the standpoint of the bureau which prepares the figures and from that of the business man who uses them. The reader gets only a momentary glimpse of employment conditions. He is unable to discern the trend of employment over previous periods, for he cannot readily compare the employment volume in the given month with the volume in any other month except that immediately preceding or the corresponding month of the previous year.

From the point of view of the statistical agency responsible for presentation of the data an even more serious objection exists. With as many as a thousand establishments, the number and identity of those reporting is bound to differ slightly from month to month. This means that three separate tabulations of data from identical firms must be prepared each month. Even if an absolutely identical group of firms in each industry reported employment each month over a long period of time, it would be difficult readily to compare trends between different industries unless the number employed in each was approximately the same.

For the same reason it would be impossible to compare employment fluctuations with other measures of business activity, such as car-loadings, retail sales, or bank debits, which are expressed in different units.

Index numbers, which express the value of any quantity or statistical series in a given month as a percentage of the value of that quantity in a selected base period, furnish a common unit of measure whereby the trend in any industry or locality may be compared over a period of time with that in other industries or with other business indicators. For these reasons index numbers of employment and wages in the principal industries and occupations of the state have been computed from the data collected by the Federal Reserve Bank and the Department of Labor and Industry.

The construction of index numbers involves the problem of selecting a suitable base period and the development of a practicable and economical method of calculating the indexes. The base period should be a year or more in length so as to avoid the influence of seasonal conditions; so far as possible, it should be a period in which fairly normal or average employment conditions existed. It should be a fairly recent period and preferably should be identical with the base period used for other indicators with which the index might profitably be compared.

The three-year period from 1923 to 1925, inclusive, was finally selected as meeting most satisfactorily these requirements for a suitable base period. Employment in most of the industries of the state was at a high level in 1923, declined substantially in 1924, and in 1925 recovered to a point about half-way between the 1923 and 1924 levels, so that the monthly average for this period represents fairly typical conditions. This period is sufficiently recent to make possible comparison with present conditions and possesses the added advantage of being identical with the base period used by the Federal Reserve Board in the construction of various indexes of national business conditions, and by the Federal Reserve Bank of Philadelphia in preparation of similar indexes of state and district conditions.

Inasmuch as the number and identity of reporting establish-

ments change somewhat from month to month, any method of constructing an index using a fixed list of identical firms obviously would be impracticable. For a changing list of firms a "chain" index may be constructed from the monthly percentages of change calculated from a comparison of the figures for identical establishments in successive months. For example, if 15 identical firms in a given industry report 2,500 employes on the roll in January and 2,600 in February, an increase of four per cent has occurred. Assuming that only 13 identical firms reported for February and March, and that the number employed by these firms was 2,000 in February and 2,100 in March, a further gain of five per cent is indicated. In the same way monthly percentage changes can be derived for March and April, April and May, May and June, etc. These successive percentages can then be "linked" together by using January employment as the base of 100. Since an increase of four per cent occurred in February the index for that month becomes 104. Since March showed a further increase of five per cent over February, the March index, in terms of January as a base, becomes 104 + five per cent of 104 = 104 + 5.2 = 109.2. In the same way index numbers on the January base can be derived for each successive month, and they can then be converted readily to any other desired base period.

The chief advantage of the chain index is that it can be calculated from reports of varying numbers of firms. It has, however, two serious disadvantages as compared with the fixed base index. In the chain index an error in the percentage change between January and February would affect not only the February index number, but also the number for every following month. This repeated error would not occur if a fixed base were used, since the index number for each month is calculated not from that of the previous month, but directly from the base period.

The other disadvantage of the chain index lies in the costliness of computation. Since it depends upon figuring changes between two months for an identical group of firms, a double tabulation—one for the given month and one for the preceding month—must be made in the preparation of each monthly index. If the fixed base be used, however, only one tabulation is necessary and the labor of calculation is greatly reduced.

Method of Calculating Index Numbers

The index numbers of employment and wages presented in this report have been calculated on a fixed base because of the greater economy and accuracy of this method. The method has been modified, however, to provide for the use of the figures from all firms reporting in a given month, whether or not they reported continuously during the entire period. The steps involved in the preparation of index numbers of employment in manufacturing industries for the period from 1923 to 1927 may be summarized briefly as follows:

1. The numbers of wage earners on the rolls of reporting establishments were totaled for each month of the period from January, 1923, to December, 1927, so as to obtain monthly employment totals for all industries combined, for each of the nine industrial groups, and for each of the 52 separate industries.

2. A preliminary base was computed by obtaining the totals of the monthly average numbers employed in 1926, when a larger number of establishments were reporting than in any previous period.

3. For each of the establishments which reported figures prior to, but not during, 1926, an estimated base figure was derived by assuming that the average 1926 employment of that firm would bear the same relation to the number on the roll in the last month in which figures were reported, as the average 1926 employment of the other firms in the industry bore to the total employment in these firms in the last month for which figures for the missing establishment were available.

4. Index numbers were then computed by dividing the total employment for each month of the period by the average 1926 employment of the identical establishments reporting in that month.

5. These preliminary index numbers were next adjusted so that the 1923 average for each index would be the same percentage above or below the 1925 average as was the average employment in the entire industry in 1923 above or below that for 1925. This was accomplished by distributing any difference uniformly over the months of the 1923-1925 period. This adjustment was necessary to make the trend of the index conform to the trend of the entire industry between 1923 and 1925, in which years the Census of Manufactures was taken.

6. After adjustment of this preliminary series to the census trend between 1923 and 1925 it was then recomputed to a 1923-1925 base by

dividing the index numbers for each month by the monthly average for the period from January, 1923, to December, 1925.

7. Seasonal relatives for this series were computed, by the median-ratio-to-moving-average method, for each of the industries or groups which displayed marked and measurable seasonality during the period.

8. Seasonally adjusted index numbers for separate industries, groups, and all industries combined, were computed by dividing each of the monthly index numbers by the seasonal relative for that month.

9. A system of weights was then calculated; it was based on the number of wage earners employed in each industry in 1925, modified by the accuracy and representativeness of the reports obtained from each industry.

10. The final weighted and seasonally adjusted index numbers were then obtained for each group of manufacturing industries and for all industries combined, by multiplying the index numbers for each industry by the weight for that industry, totaling these weight products for each month and dividing each of these monthly totals by the sum of the weights.

Illustration of the Procedure

Index numbers on preliminary base

A detailed description of the steps involved in computation of index numbers for the meat packing industry will illustrate the method, which was practically identical for all industries and occupations. In the second and third columns of Table IX are shown, respectively, the number of establishments reporting, and the number of wage earners employed by these plants, in each month of the period from 1923 to 1927. Index numbers for 1926, shown in the fifth column, were computed by dividing the actual employment reported for each month of that year by the average number employed during the year by the entire group of 14 establishments. Thus the index for January, 1926, 101.6, was derived by dividing 2,121 by 2,087. The February index is 2,080 divided by 2,087, or 99.7. In the same way preliminary index numbers, on a 1926 base, were obtained for each of the months from July, 1925, to December, 1927, during which period the same 14 plants were reporting.

TABLE IX

Calculation of Index Numbers on 1923-1925 Base for the Meat Packing Industry

Year and month	Number of reporting firms	Number of wage earners	Base—1926 monthly average	Index numbers—1926 base	Adjustment—number of points	Adjusted index numbers	Index numbers—1923–1925 base*
1923							
Jan.	15	2,326	2,143	108.5	+2.8	111.3	107.0
Feb.	15	2,286	2,143	106.7	+2.7	109.4	105.2
Mar.	15	2,215	2,143	103.4	+2.6	106.0	101.9
Apr.	15	2,199	2,143	102.6	+2.5	105.1	101.1
May	15	2,201	2,143	102.7	+2.4	105.1	101.1
June	15	2,166	2,143	101.1	+2.3	103.4	99.4
July	15	2,249	2,143	104.9	+2.3	107.2	103.1
Aug.	15	2,132	2,143	99.5	+2.2	101.7	97.8
Sept.	15	2,261	2,143	105.5	+2.1	107.6	103.5
Oct.	15	2,297	2,143	107.2	+2.0	109.2	105.0
Nov.	15	2,302	2,143	107.4	+1.9	109.3	105.1
Dec.	15	2,340	2,143	109.2	+1.8	111.0	106.7
Avg.				104.9	+2.3	107.2	103.1
1924							
Jan.	14	2,231	2,062	108.2	+1.7	109.9	105.7
Feb.	14	2,249	2,062	109.1	+1.6	110.7	106.4
Mar.	14	2,197	2,062	106.6	+1.5	108.1	103.9
Apr.	14	2,181	2,062	105.8	+1.4	107.2	103.1
May	14	2,091	2,062	101.4	+1.3	102.7	98.7
June	14	2,108	2,062	102.2	+1.2	103.4	99.4
July	13	2,048	2,050	99.9	+1.1	101.0	97.1
Aug.	13	2,020	2,050	98.5	+1.0	99.5	95.7
Sept.	13	2,060	2,050	100.5	+ .9	101.4	97.5
Oct.	13	2,124	2,050	103.6	+ .8	104.4	100.4
Nov.	13	2,137	2,050	104.2	+ .7	104.9	100.9
Dec.	13	2,149	2,050	104.8	+ .6	105.4	101.3
Avg.				103.7	+1.2	104.9	100.9
1925							
Jan.	13	2,151	2,050	104.9	+ .5	105.4	101.3
Feb.	13	2,115	2,050	103.2	+ .4	103.6	99.6
Mar.	13	2,026	2,050	98.8	+ .3	99.1	95.3
Apr.	13	2,004	2,050	97.8	+ .2	98.0	94.2
May	13	1,984	2,050	96.8	+ .1	96.9	93.2
June	13	1,976	2,050	96.4	+ .0	96.4	92.7
July	14	2,037	2,087	97.6	— .0	97.6	93.8
Aug.	14	2,051	2,087	98.3	— .1	98.2	94.4
Sept.	14	2,053	2,087	98.4	— .2	98.2	94.4
Oct.	14	2,120	2,087	101.6	— .3	101.3	97.4
Nov.	14	2,181	2,087	104.5	— .4	104.1	100.1
Dec.	14	2,122	2,087	101.7	— .5	101.2	97.3
Avg.				100.0	.0	100.0	96.2

TABLE IX—*Concluded*

CALCULATION OF INDEX NUMBERS ON 1923-1925 BASE FOR THE MEAT PACKING INDUSTRY

Year and month	Number of reporting firms	Number of wage earners	Base—1926 monthly average	Index numbers—1926 base	Adjustment—number of points	Adjusted index numbers	Index numbers—1923–1925 base*
1926							
Jan.	14	2,121	2,087	101.6		101.6	97.7
Feb.	14	2,080	2,087	99.7		99.7	95.9
Mar.	14	2,094	2,087	100.3		100.3	96.4
Apr.	14	2,014	2,087	96.5		96.5	92.8
May	14	2,044	2,087	97.9		97.9	94.1
June	14	2,050	2,087	98.2		98.2	94.4
July	14	2,060	2,087	98.7		98.7	94.9
Aug.	14	2,012	2,087	96.4		96.4	92.7
Sept.	14	2,085	2,087	99.9		99.9	96.1
Oct.	14	2,130	2,087	102.1		102.1	98.2
Nov.	14	2,191	2,087	105.0		105.0	101.0
Dec.	14	2,168	2,087	103.9		103.9	99.9
Avg.				100.0		100.0	96.2
1927							
Jan.	14	2,141	2,087	102.6		102.6	98.6
Feb.	14	2,108	2,087	101.0		101.0	97.1
Mar.	14	2,074	2,087	99.4		99.4	95.6
Apr.	14	2,047	2,087	98.1		98.1	94.3
May	14	2,027	2,087	97.1		97.1	93.4
June	14	2,093	2,087	100.3		100.3	96.4
July	14	2,089	2,087	100.1		100.1	96.2
Aug.	14	2,068	2,087	99.1		99.1	95.3
Sept.	14	2,105	2,087	100.9		100.9	97.0
Oct.	14	2,109	2,087	101.1		101.1	97.2
Nov.	14	2,136	2,087	102.4		102.4	98.5
Dec.	14	2,148	2,087	102.9		102.9	98.9
Avg.				100.4		100.4	96.5

* 1923-1925 average used in computing these index numbers was 104.0.

Prior to July, 1925, and subsequent to June, 1924, only 13 establishments reported data. The index numbers for this period were computed by dividing the monthly employment totals for these 13 plants by 2,050, the average number employed by them in 1926.

After June, 1924, one plant, which had been reporting steadily, discontinued its monthly reports, thus reducing the number of establishments from 14 to 13. Since this firm was not reporting in 1926, it was necessary to calculate for it an assumed 1926 average, to be used as a base, so that the figures for this firm might be included in the index. In June, 1924, when its last report was received, this plant employed 12 wage earners. The remaining group of 13 plants employed 2,096 workers in that month, as compared with an average of 2,050, or 98 per cent as many, in the 1926-base period. Applying this same percentage to 12, a base of 11.8, or 12, representing the assumed 1926 employment of this establishment, is obtained. The base figure used in computing index numbers for these 14 establishments for June, 1924, and the preceding months is thus 2,050 + 12, or 2,062. During 1923 figures from an additional plant were included in the index. An assumed 1926 base was computed for this establishment by the same method, and the figure obtained, 81, was added to 2,062 to give the base of 2,143 used in calculating index numbers for the 15 plants reporting during 1923.

The method just described, though somewhat difficult to explain, is based upon entirely valid assumptions, and gives exactly the same results as if a chain index were computed. Moreover, it gives a much needed flexibility to the fixed-base method which permits the use of figures reported by establishments which have either discontinued reporting prior to the base year, or have commenced reporting subsequent to the base year.

Adjustment to the Census trend

The index numbers in the fifth column of Table IX, shown graphically on Chart I, indicate the percentage which the number of wage earners employed by establishments reporting in each month is of the average number employed by the same establishments in 1926. These index numbers thus portray the trend of employment in the meat packing industry of Pennsylvania, *in so far as these establishments represent conditions throughout the entire industry*. For obvious reasons, an index such as this, which does not include all of the establishments in the industry, cannot

be depended upon to reflect employment changes in the entire industry with absolute accuracy. To achieve such a result it would be necessary to take a monthly census of the entire industry; an undertaking which is neither feasible nor desirable.

One source of error which affects the validity of any employment index, especially when comparisons are made over a long period, rests in the fact that a sample consisting of a fixed or nearly fixed group of firms does not give full weight to the effect of newly organized establishments which commence operations after the reporting firms have been selected. Thus, in a period of great industrial expansion, when many new and rapidly growing firms are commencing operations, the long established firms are growing less rapidly than the industry as a whole, and the index tends to understate the extent of the rise that has taken place.

In a period of general decline, on the other hand, when many firms are being liquidated or are suspending operations, the index may tend to understate somewhat the extent of the decline, for the firm which contemplates shutting down is likely to discontinue reporting before the labor force is entirely discharged. On the whole, an employment index based upon a fixed group of firms is likely to be more heavily weighted with the firms whose operations are shrinking, or are expanding only moderately, than with those which are growing rapidly, and the index will, therefore, tend to have a slight downward bias. For this reason every effort has been made in the collection of data for these indexes to strengthen the sample by adding new plants at frequent intervals.

Although, of course, no practicable method exists for removing such a bias at the time the figures are being collected, it is possible to adjust the index whenever Census data showing actual employment for the entire industry become available. The recent publication of the 1925 Census of Manufactures has made possible an adjustment of the index numbers for manufacturing industries for the period from 1923 to 1925.

According to the Census of Manufactures, the average number of wage earners employed in the meat packing industry of the state in 1923 was 5,933, or 7.2 per cent more than 5,537, the

number engaged in 1925. As shown in Table IX, however, the average 1923 employment of the establishments included in the index was only 4.9 per cent above the 1925 level. Thus the 1926 base preliminary index has accumulated an upward bias of 2.3 per cent, or 0.1 of a point per month in the period from 1923 to 1925, through the influence of the factors described above. This discrepancy was removed by "tilting" or "pivoting" the 36-month series of index numbers around the middle of 1925 as an axis to such a point that the 1923 average of the adjusted series would be 7.2 per cent above the 1925 average. The adjustment factors for each month of the period and the adjusted index numbers are shown in the sixth and seventh columns, respectively, of Table IX, and the adjusted index is shown graphically in Chart I.

The preliminary 1926 base index numbers for other manufacturing industries and groups were adjusted in the same way. Table X shows the monthly adjustment factors used for the employment and payroll indexes for each industry and group and for all industries combined, and the "pivot point" used in each instance. In some cases the 1925 trend of the uncorrected 1926 base index corresponded closely to the Census relatives, and December, 1924, was used as a pivot month; in all other instances the series was pivoted about June-July, 1925. It is significant that although several of the individual industries show a considerable spread from the Census data, the index for all manufacturing industries had a difference of only 1.2 points, or only .05 of a point a month in the entire period.

Final index numbers

The final step consists in the conversion of this preliminary series to a 1923-1925 base by dividing the adjusted 1926-base index numbers for each month by the monthly average of the series for the entire 1923-1925 period. Thus the 1923-1925 base index numbers, shown in the eighth column of Table IX and on Chart I, are derived by dividing each of the 1926-base adjusted index numbers by 104.0, the monthly average of the latter series

TABLE X

Adjustment of Manufacturing Indexes to Census Trend

Industries*	Pivoted at†	Employment indexes		Wage payment indexes	
		Adj. of 1923 average—points	Monthly adjustment—points	Adj. of 1923 average—points	Monthly adjustment—points
ALL MANUFACTURING INDUSTRIES	C	— 1.2	— .05	— 4.1	— .17
METAL PRODUCTS	D	+ 9.0	+ .49	+ 6.5	+ .35
Blast furnaces‡	C	+71.5	+3.88	+66.3	+3.68
Steel works and rolling mills	D	+10.2	+ .55	+ 7.1	+ .38
Structural iron works	D	— .5	— .03	+ 9.3	+ .50
Steam and hot-water heating apparatus	D	— 7.3	— .40	—13.6	— .74
Stoves and furnaces	C	— 9.9	— .41	—15.0	— .63
Foundries	C	+ .5	+ .02	— 3.9	— .17
Machinery and parts	D	+10.5	+ .57	+13.4	+ .72
Electrical apparatus§	D	+24.4	+3.15	+24.2	+3.13
Engines and pumps	C	+17.0	+ .71	+15.6	+ .65
Hardware and tools	C	—11.6	— .48	—15.2	— .63
Brass and bronze products	D	—46.3	—2.50	—33.4	—2.08
TRANSPORTATION EQUIPMENT	D	—11.3	— .61	—10.2	— .54
Automobiles	D	+ 3.8	+ .21	+ 6.1	+ .33
Automobile bodies and parts	C	— 2.8	— .12	+ 5.2	+ .22
Railroad repair shops	D	— 4.1	— .22	— 3.0	— .16
Shipbuilding	D	— 7.5	— .41	+ 4.1	+ .22
TEXTILE PRODUCTS	C	— 1.2	— .05	— 3.5	— .15
Cotton goods	D	+ 6.2	+ .34	+ 4.7	+ .25
Woolens and worsteds	C	+16.1	+ .68	+ 6.3	+ .25
Silk goods	C	— 5.5	— .23	— 7.7	— .32
Textile dyeing and finishing	C	—15.2	— .63	—20.5	— .86
Carpets and rugs	D	+ .3	+ .02	— 8.2	— .44
Hats	C	—10.0	— .41	+ 5.9	+ .25
Hosiery	D	— 1.9	— .10	— 4.1	— .22
Knit goods, other	C	+29.7	+1.24	+34.0	+1.42
Men's clothing	D	—12.6	— .72	—34.8	—1.88
Women's clothing	C	+ 6.0	+ .25	+ 5.6	+ .24
Shirts and furnishings	C	—28.5	—1.19	—26.0	—1.08
FOODS AND TOBACCO	C	+ 2.3	+ .10	+ 2.6	+ .11
Bread and bakery products#	D	+ 2.5	+ .51	+ 4.5	+ .93
Confectionery	D	+ 5.2	+ .28	+ .00	+ .00
Ice cream	C	+16.3	+ .68	+12.8	+ .53
Meat packing	C	+ 2.3	+ .10	+12.4	+ .52
Sugar refining	C	+ 1.0	+ .05	— 5.9	— .25
Cigars and tobacco	D	— 8.2	— .44	—16.8	— .90

TABLE X—*Concluded*

ADJUSTMENT OF MANUFACTURING INDEXES TO CENSUS TREND

Industries*	Pivoted at†	Employment indexes		Wage payment indexes	
		Adj. of 1923 average—points	Monthly adjustment—points	Adj. of 1923 average—points	Monthly adjustment—points
STONE, CLAY AND GLASS PRODUCTS	C	+12.8	+ .53	+12.2	+ .51
Brick, tile and pottery	D	+12.8	+ .69	+10.5	+ .57
Cement	C	— 2.1	— .10	— .2	— .01
Glass	C	+19.2	+ .80	+16.4	+ .68
LUMBER PRODUCTS	C	+ 4.0	+ .17	+ .2	+ .01
Lumber and planing mills	C	+ 8.6	+ .36	— 2.0	— .08
Furniture	D	— 1.5	— .09	+ .8	+ .04
Wooden boxes	C	+ 2.2	+ .09	+ .1	+ .01
CHEMICAL PRODUCTS	C	+ 3.0	+ .13	— 4.0	— .17
Explosives	D	+ 8.0	+ .43	+21.4	+1.16
Paints and varnishes	D	— 8.3	— .45	—19.5	—1.05
Petroleum refining	D	— .3	— .02	— 6.0	— .32
LEATHER AND RUBBER PRODUCTS	C	+ 2.8	+ .12	— 4.0	— .17
Leather tanning	C	+ 9.5	+ .40	+ 3.8	+ .16
Shoes	D	+ 9.0	+ .50	+ .7	+ .03
Leather products, other	C	—13.5	— .56	— 8.0	— .33
Rubber tires and goods	C	—36.8	—1.53	—53.1	—2.21
PAPER AND PRINTING	C	— 2.0	— .08	— 3.6	— .15
Paper and wood pulp	D	— 2.1	— .10	— 4.4	— .24
Paper boxes and bags	C	+ 7.5	+ .31	— 6.8	— .28
Printing and publishing	C	— 5.3	— .22	— 4.6	— .19

* Census data were not available for the adjustment of iron and steel forgings, locomotives and cars, chemicals and drugs, and coke.

† C=June-July, 1925; D=December, 1924.

‡ Adjusted to census trend by raising all 1923 monthly index numbers 9.0 points and pivoting unadjusted series from June-July, 1925, back to January, 1924.

§ Adjusted by pivoting from December, 1924, back to July, 1923.

‡ Adjusted by pivoting from December, 1924, back to September, 1923.

for the period from 1923 to 1925. This operation, as shown on the chart, merely results in a series of index numbers about four points below, but parallel to the 1926 base series. The final 1923-1925 base index numbers for each of the manufacturing industries and groups, and for all manufacturing industries, have been ob-

tained by the same method, and are shown in the Appendix and on Chart VI.

Index numbers of payrolls in manufacturing industries were calculated in the same way, except that instead of average employment, total wage payments, as reported by the Census of Manufactures for 1923 and 1925, were used in adjusting the preliminary 1926-base indexes.

Similar methods were also used in computing index numbers for anthracite mining, transportation, retail trade and wholesale trade, shown on Chart II and in the Appendix. Since Census figures were not available for these occupations, the preliminary 1926-base series were converted directly to the 1923-1925 base.

Removal of seasonal variation

It is apparent from an examination of Chart VI that the monthly employment volume in many of the manufacturing industries shows a marked and recurrent seasonal movement in each year of the period. In some industries, such as confectionery, ice cream and electrical apparatus, the seasonal variation is most pronounced, and is repeated each year with a fair degree of uniformity. In other industries, such as printing and publishing, and machinery manufacture, the seasonal movement is either so small as to be insignificant or appears to be entirely absent.

Obviously the recurrence each year of a marked seasonal variation, such as that which is evident in the index of employment in the meat packing industry, while it may be of considerable significance in itself, tends to obscure the long time trend and the cyclical movement of the index. For that reason it is desirable in such instances to remove the influence of these normal seasonal conditions by computing index numbers, "adjusted for seasonal variations," so that the trend of employment is shown as if no seasonal fluctuations occurred in the industry. The employment index numbers were therefore carefully examined and tested to discover whether an appreciable seasonal movement existed, and whether it was sufficiently regular from year to year to permit of its measurement with a record available for only five years. This was found to be the case in many of the manufacturing industries, in retail trade, and in the construction industry.

TABLE XI

Calculation of Seasonal Relatives and of Seasonally Adjusted Index Numbers for Meat Packing Industry

Year and month	Original index—1923–1925 base	12 months' moving total of original index	12 months' moving average of original index	Ratio of original index to moving average	Index, adjusted for seasonal variation
1923					
January	107.0		103.1	103.8	103.9
February	105.2		103.1	102.0	103.1
March	101.9		103.1	98.8	102.9
April	101.1		103.1	98.1	104.2
May	101.1		103.1	98.1	104.2
June	99.4		103.1	96.4	101.4
July	103.1	1236.9	103.1	100.0	104.1
August	97.8	1235.6	103.0	95.0	100.8
September	103.5	1236.8	103.1	100.4	103.5
October	105.0	1238.8	103.2	101.7	102.9
November	105.1	1240.8	103.4	101.6	102.0
December	106.7	1238.4	103.2	103.4	103.6
1924					
January	105.7	1238.4	103.2	102.4	102.6
February	106.4	1232.4	102.7	103.6	104.3
March	103.9	1230.3	102.5	101.4	104.9
April	103.1	1224.3	102.0	101.1	106.3
May	98.7	1219.7	101.6	97.1	101.8
June	99.4	1215.5	101.3	98.1	101.4
July	97.1	1210.1	100.8	96.3	98.1
August	95.7	1205.7	100.5	95.2	98.7
September	97.5	1198.9	99.9	97.6	97.5
October	100.4	1190.3	99.2	101.2	98.4
November	100.9	1181.4	98.4	102.5	98.0
December	101.3	1175.9	98.0	103.4	98.3
1925					
January	101.3	1169.2	97.4	104.0	98.3
February	99.6	1165.9	97.2	102.5	97.6
March	95.3	1164.6	97.0	98.2	96.3
April	94.2	1161.5	96.8	97.3	97.1
May	93.2	1158.5	96.5	96.6	96.1
June	92.7	1157.7	96.5	96.1	94.6
July	93.8	1153.7	96.1	97.6	94.7
August	94.4	1150.1	95.8	98.5	97.3
September	94.4	1146.4	95.5	98.8	94.4
October	97.4	1147.5	95.6	101.9	95.5
November	100.1	1146.1	95.5	104.8	97.2
December	97.3	1147.0	95.6	101.8	94.5

TABLE XI—*Concluded*

CALCULATION OF SEASONAL RELATIVES AND OF SEASONALLY ADJUSTED INDEX NUMBERS FOR MEAT PACKING INDUSTRY

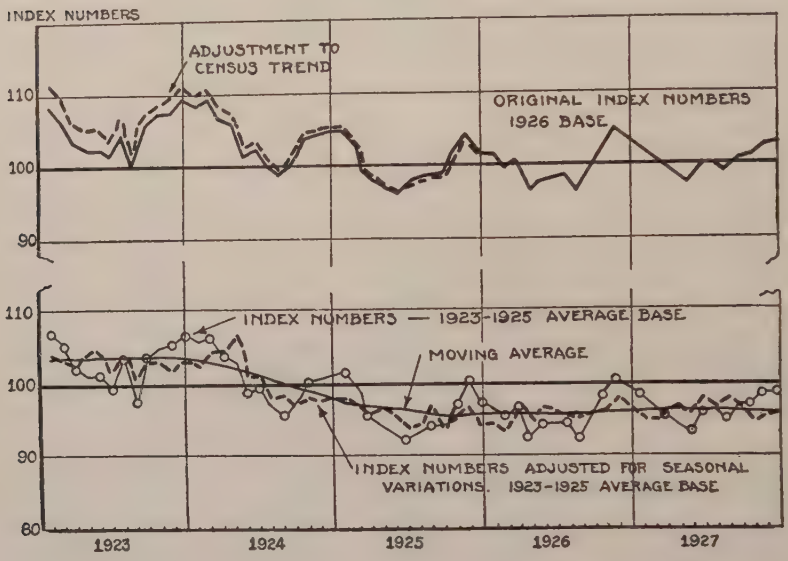
Year and month	Original index—1923–1925 base	12 months' moving total of original index	12 months' moving average of original index	Ratio of original index to moving average	Index, adjusted for seasonal variation
1926					
January	97.7	1148.7	95.7	102.1	94.9
February	95.9	1149.8	95.8	100.1	94.0
March	96.4	1148.1	95.7	100.7	97.4
April	92.8	1149.8	95.8	96.9	95.7
May	94.1	1150.6	95.9	98.1	97.0
June	94.4	1151.5	96.0	98.3	96.3
July	94.9	1154.1	96.2	98.6	95.9
August	92.7	1155.0	96.2	96.4	95.6
September	96.1	1156.2	96.3	99.8	96.1
October	98.2	1155.4	96.3	102.0	96.3
November	101.0	1156.9	96.4	104.8	98.1
December	99.9	1156.2	96.3	103.7	97.0
1927					
January	98.6	1158.2	96.5	102.2	95.7
February	97.1	1159.5	96.6	100.5	95.2
March	95.6	1162.1	96.8	98.8	96.6
April	94.3	1163.0	96.9	97.3	97.2
May	93.4	1162.0	96.8	96.5	96.3
June	96.4	1159.5	96.6	99.8	98.4
July	96.2	1158.5	96.5	99.7	97.2
August	95.3		96.5	98.8	98.2
September	97.0		96.5	100.5	97.0
October	97.2		96.5	100.7	95.3
November	98.5		96.5	102.1	95.6
December	98.9		96.5	102.5	96.0

The method* used in deriving the monthly relatives, showing the typical seasonal variation in these industries and in calculating seasonally adjusted index numbers, can be illustrated by reference again to the meat packing industry. In the second column of Table XI are shown the 1923-1925-base index numbers of em-

* This method, known as the median-ratio-to-moving-average method, was first devised and used by Dr. F. R. Macaulay of the National Bureau of Economic Research.

CHART I

CALCULATION OF INDEX NUMBERS OF EMPLOYMENT IN THE MEAT PACKING INDUSTRY



ployment in this industry for each month from 1923 to 1927. In the third column, opposite the index number for each month, is shown the total of the index numbers for the twelve months of which that index number is the seventh, chronologically. Thus, the number, 1236.9, in the third column, opposite July, 1923, is the total of the index numbers for the months from January, 1923, to December, 1923, inclusive. And the number, 1235.6, opposite August, 1923, is the total of the index numbers for the twelve months from February, 1923, to January, 1924, inclusive. The other twelve months' moving totals were obtained in the same way.

The fourth column shows the averages obtained from the twelve

months' totals centered at each month. Thus, 103.1, shown in the fourth column for July, 1923, is the average obtained by dividing the twelve months' total for that month, 1236.9, by 12. The average for August, 1923, 103.0, was similarly obtained by dividing 1235.6 by 12, and the remaining moving averages were computed by the same method. For the first six months of 1923 moving totals and moving averages could not be computed as figures were not available prior to January of that year. Hence, the average for the calendar year—103.1—was used for this period. For the same reason, since totals and averages for the last five months of 1927 could not be computed, the average for the calendar year 1927—96.5—was used for these months.

These moving averages are plotted on Chart I in comparison with the original 1923-1925-base index numbers. It will be seen that the former series makes a smoothed curve devoid of seasonal variations, cutting through the original series, while following its general trend. The next step consists in expressing the original index number for each month as a percentage of the moving average for the same month. In the fifth column of Table XI are shown these ratios of the original data to the moving averages. Thus the ratio for July, 1923,—100.0—was obtained by dividing 103.1 by 103.1, and the ratio for August, 1923, is 97.8 divided by 103.0, or 95.0. The figures in the fifth column, then, show the seasonal variations of the original indexes; *i. e.,* the index for each month is expressed as a percentage of the average for the year of which that month is most nearly at the center.

These seasonal ratios of the original indexes to the moving averages are then arranged in Table XII in order of their magnitude for each month. Thus the highest ratio for any January, 104.0, is shown at the top of the first column, the second largest January ratio, 103.8, is shown in the second place in the first column, and the ratios for other months are arranged in the same manner.

The selected seasonal relative for each month might then be obtained by averaging the five ratios for each month, but this method would be open to the objection that it gives undue weight

TABLE XII

SELECTION OF MEDIAN RATIOS: MEAT PACKING INDUSTRY

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	104.0	103.6	101.4	101.1	98.1	99.8	100.0	98.8	100.5	102.0	104.8	103.7
	103.8	102.5	100.7	98.1	98.1	98.3	99.7	98.5	100.4	101.9	104.8	103.4
Med ------	102.4	102.0	98.8	97.3	97.1	98.1	98.6	96.4	99.8	101.7	102.5	103.4
	102.2	100.5	98.8	97.3	96.6	96.4	97.6	95.2	98.8	101.2	102.1	102.5
	102.1	100.1	98.2	96.9	96.5	96.1	96.3	95.0	97.6	100.7	101.6	101.8
Avg. -----	102.9	101.5	99.6	98.1	97.3	97.7	98.4	96.8	99.4	101.5	103.2	103.0

to the extremely high or low values among the ratios which might have been caused by other than seasonal influences. For this reason it is preferable to use either an average of the three middle ratios, or the median, or middle ratio. Thus for January, the average of all five ratios is 102.9, the average of the three middle ratios is 102.8 and the median ratio is 102.4.

The values obtained by each of these three methods are shown in the second, fourth and sixth columns of Table XIII. The actual values derived for each month by each method were next totaled, and the small differences between each of these three totals and 1200 were distributed proportionally over the monthly ratios so that the adjusted figures would total 1200. It will be noticed that the tentative seasonal relatives obtained by each of these three methods show quite similar general characteristics, viz., full employment volume in the fall and winter months and a slackening during the spring and summer, although there are minor differences between the three relatives for each month.

The eighth column shows the finally selected relatives, in round numbers, which were believed to express best the typical seasonal variation of employment in reporting meat packing establishments during the five years from 1923 to 1927. The median ratios expressed in round numbers were generally found to be the most suitable seasonal relatives, although the judgment of the investigator was not subordinated to a rigid and inflexible mathematical procedure in making this final selection. In some cases the adjusted average of the three middle ratios or the average of all

five ratios, instead of the median ratio, was selected as the seasonal relative. Thus a December relative of 103, rather than 104, was believed to represent most closely the typical seasonal employment level in that month.

TABLE XIII

SELECTION OF SEASONAL RELATIVES: MEAT PACKING INDUSTRY

Month	Avg. of 5 ratios		Avg. of 3 middle ratios		Median ratios		Selected seasonal relatives
	Actual	Adj. to total 1200	Actual	Adj. to total 1200	Actual	Adj. to total 1200	
Jan.	102.9	103.0	102.8	102.9	102.4	102.6	103
Feb.	101.5	101.6	101.7	101.8	102.0	102.2	102
Mar.	99.6	99.7	99.4	99.5	98.8	99.0	99
Apr.	98.1	98.1	97.6	97.6	97.3	97.4	97
May	97.3	97.3	97.3	97.3	97.1	97.2	97
June	97.7	97.7	97.6	97.6	98.1	98.2	98
July	98.4	98.4	98.6	98.7	98.6	98.7	99
Aug.	96.8	96.8	96.7	96.7	96.4	96.5	97
Sept.	99.4	99.4	99.7	99.8	99.8	100.0	100
Oct.	101.5	101.6	101.6	101.7	101.7	101.9	102
Nov.	103.2	103.3	103.1	103.2	102.5	102.7	103
Dec.	103.0	103.1	103.1	103.2	103.4	103.6	103
Total	1199.4	1200.0	1199.2	1200.0	1198.1	1200.0	1200

Seasonal relatives of employment in other industries were obtained by the procedure just described for the meat packing industry.* Relatives were calculated for all industries in which the seasonal movement was conspicuous and sufficiently uniform to permit fairly accurate determination, and the finally selected relatives for each industry and group are shown in Table XVIII and on Chart III.

The seasonally adjusted index numbers for the meat packing industry, shown in the sixth column of Table XI were derived by dividing the unadjusted index for each month by the seasonal

* In the construction industry monthly records for only two years were available; hence seasonal relatives were computed by taking averages of these pairs of relatives for each month.

relative for that month. Thus the seasonally corrected index number for January, 1923, was obtained by dividing 107.0, the unadjusted index, by 103, the seasonal relative for that month; indexes for the other months were obtained by similar computations. The seasonally adjusted index numbers of employment in the various industries and groups for which seasonal relatives were computed are shown in the Appendix.

Weighted index numbers

The method which has just been described in detail for the meat packing industry was used in calculating index numbers of employment for the period from 1923 to 1927 for each of the 52 manufacturing industries, for nine groups of industries and for all manufacturing industries combined. It was also used for employment indexes in retail trade and wholesale trade, and in anthracite mining and transportation, for the period from 1921 to 1927, except that the 1926-base index numbers for these occupations could not be adjusted to the Census trend.

Index numbers of wage payments in manufacturing industries for the period from 1923 to 1927 and in the anthracite and transportation industries for the period from 1921 to 1927 were also compiled by identical procedure except that no seasonal adjustment was attempted for these series. The payroll indexes represent total wage payments made in the week ending nearest the 15th day of each month and, although these series display marked seasonality in many cases, the occurrence of holidays during the payroll period and the more violent fluctuation of these indexes makes difficult the selection of accurate seasonal relatives.

In the calculation of unweighted group and all industry indexes by this method the various industries included are represented in the index, not in proportion to the relative importance of each as an employer of labor in the state, but in proportion to the size of the employment sample obtained from each. For example, the entire electrical apparatus industry in the state employs 4.3 per cent of the total number of workers engaged in all of the industries included in the index; but the reporting establishments in this industry employ only 2.1 per cent of the total number

employed by all reporting manufacturing establishments. The electrical apparatus industry, as well as several others, is, therefore, underweighted in the index. On the other hand, several other industries, such as railroad repair shops and the manufacture of locomotives and cars are considerably overweighted.

For that reason it was believed desirable to compute weighted indexes for the groups and for all industries combined, which would be based upon the relative importance of each industry as an employer of labor in the state, and upon the reliability of the reporting sample in that industry. The method of selecting the weights for the factory employment indexes is shown in Table XIV. The second column, based upon Census data for 1925, shows what percentage of the total number of workers engaged in all 52 industries are employed in each industry and group included in the index; while the third column shows the industrial distribution of workers employed in reporting establishments. It is readily apparent that certain industries, such as locomotives and cars and railroad repair shops, are considerably overweighted in the index, while in others, such as silk goods and hosiery, the relative importance of the reporting sample is less than that of the industry from which it has been obtained.

The percentages shown in the second column might be used in computing weighted index numbers for the nine groups and for all industries combined were it not for the fact that reporting samples obtained from a few of the individual industries were so unreliable as to make it inadvisable to give full weight to the indexes for these industries. Although a very small reporting sample may sometimes give satisfactory results, it is generally unsafe to place too much reliance in reports from a group of firms which employ less than 15 or 20 per cent of the total number of workers engaged in the industry. Reference to Table III, showing the percentage of the total number employed by reporting firms in each industry, and to Table XIX, showing correlations of monthly fluctuations in the indexes for certain industries with the corresponding Census relatives for the years 1923 and 1925, makes it apparent that certain industries included in the index, notably men's clothing, women's clothing, paints and varnishes,

TABLE XIV

SELECTION OF WEIGHTS FOR INDEXES OF FACTORY EMPLOYMENT

Group and industry	Per cent distribution of average number employed in 1925		Selected weights (per cent)	Final weights, adjusted to total 100 per cent
	Census	Reporting establishments		
ALL INDUSTRIES (52)	100.0	100.0	91.8	100.0
METAL PRODUCTS	36.9	36.1	35.2	38.3
Blast furnaces	1.0	1.1	1.0	1.1
Steel works and rolling mills	18.3	20.4	18.3	19.9
Iron and steel forgings	.5	.9	.5	.5
Structural iron work	1.2	1.1	1.2	1.3
Steam and hot-water heating apparatus	1.0	1.6	1.0	1.1
Stoves and furnaces	.3	.3	.3	.3
Foundries	3.2	2.7	3.2	3.5
Machinery and parts	4.0	2.4	3.2	3.5
Electrical apparatus	4.3	2.1	3.5	3.8
Engines and pumps	.9	1.0	.9	1.0
Hardware and tools	1.8	2.3	1.8	2.0
Brass and bronze products	.4	.2	.3	.3
TRANSPORTATION EQUIPMENT	12.5	23.3	12.1	13.2
Automobiles	.7	1.8	.7	.8
Automobile bodies and parts	1.6	1.2	1.2	1.3
Locomotives and cars	2.0	4.4	2.0	2.2
Railroad repair shops	7.7	14.8	7.7	8.4
Ship building	.5	1.1	.5	.5
TEXTILE PRODUCTS	24.6	16.7	21.5	23.4
Cotton goods	1.4	1.2	1.2	1.3
Woolens and worsteds	2.2	2.1	2.2	2.4
Silk goods	7.3	5.3	7.0	7.6
Textile dyeing and finishing	1.0	.5	.8	.9
Carpets and rugs	1.2	1.0	1.2	1.3
Hats	.6	1.3	.6	.6
Hosiery	4.5	3.1	4.5	4.9
Knit goods, other	1.4	1.0	1.0	1.1
Men's clothing	2.0	.4	1.0	1.1
Women's clothing	1.2	.2	.8	.9
Shirts and furnishings	1.8	.6	1.2	1.3
FOODS AND TOBACCO	8.1	6.6	7.2	7.8
Bread and bakery products	2.4	1.3	1.9	2.1
Confectionery	.8	1.4	.8	.9
Ice cream	.3	.3	.3	.3
Meat packing	.7	.6	.7	.7
Sugar refining	.3	.6	.3	.3
Cigars and tobacco	3.6	2.4	3.2	3.5

TABLE XIV—*Concluded*

SELECTION OF WEIGHTS FOR INDEXES OF FACTORY EMPLOYMENT

Group and industry	Per cent distribution of average number employed in 1925		Selected weights (per cent)	Final weights, adjusted to total 100 per cent
	Census	Reporting establishments		
STONE, CLAY AND GLASS PRODUCTS	5.9	6.2	5.3	5.8
Brick, tile and pottery	2.4	1.5	1.8	2.0
Cement	1.2	2.2	1.2	1.3
Glass	2.3	2.5	2.3	2.5
LUMBER PRODUCTS	2.8	1.9	2.5	2.7
Lumber and planing mills	.9	.9	.9	1.0
Furniture	1.5	.8	1.3	1.4
Wooden boxes	.4	.2	.3	.3
CHEMICAL PRODUCTS	2.8	3.3	2.3	2.5
Chemicals and drugs	.9	.4	.7	.8
Coke	.4	.8	.4	.4
Explosives	.2	.1	.1	.1
Paints and varnishes	.4	.2	.2	.2
Petroleum refining	.9	1.8	.9	1.0
LEATHER AND RUBBER PRODUCTS	3.0	3.4	2.9	3.2
Leather tanning	1.0	1.6	1.0	1.1
Shoes	1.4	1.3	1.4	1.6
Leather products, other	.2	.2	.2	.2
Rubber tires and goods	.4	.3	.3	.3
PAPER AND PRINTING	3.4	2.5	2.8	3.1
Paper and wood pulp	1.1	1.2	1.1	1.2
Paper boxes and bags	.7	.2	.4	.5
Printing and publishing	1.6	1.1	1.3	1.4

and explosives are inadequately represented by the reporting sample. Of course the indexes for these industries accurately reflect conditions in the plants which reported data, but these establishments are probably not typical of the entire industry.

These and a few other industries were therefore assigned weights somewhat smaller than the Census weights shown in the second column of Table XIV. In nearly half of all the industries, however, the reporting sample was relatively larger than the Census sample, and in nearly all the remaining industries the

reporting sample, though smaller than the Census sample, was found to be adequately representative of employment conditions throughout the industry. Census percentages were therefore used for the selected weights, shown in the third column of Table XIV, except where the sample was believed to be not entirely reliable; in such cases a smaller weight was assigned to that industry.

TABLE XV

WEIGHTED INDEX FOR TEXTILE PRODUCTS GROUP FOR MAY, 1925

Industries	Index numbers May, 1925	Weights	Weight—products
Cotton goods	*99.3	1.3	129.09
Woolens and worsteds	*88.5	2.4	212.40
Silk goods	112.3	7.6	853.48
Textile dyeing and finishing	*105.1	.9	94.59
Carpets and rugs	*104.8	1.3	136.24
Hats	98.6	.6	59.16
Hosiery	110.8	4.9	542.92
Knit goods, other	96.5	1.1	106.15
Men's clothing	101.8	1.1	111.98
Women's clothing	99.1	.9	89.19
Shirts and furnishings	109.7	1.3	142.61
Totals		23.4	2477.81

Weighted index number=2477.81÷23.4=105.9

* Adjusted for seasonal variation.

These tentatively selected weights, which totaled 91.8, were then adjusted to total 100 by distributing the difference of 8.2 per cent proportionally over all of them. The percentages shown in the fifth column constitute the final selected weights which are believed to express the importance which should be assigned to each individual industry in constructing weighted indexes for groups and for all industries combined. These weights were therefore used in computing the weighted indexes shown in the Appendix.

In obtaining the weighted group index number for any one month, the index for each industry in the group for that month

was multiplied by the weight assigned to that industry; these products were then totaled and divided by the sum of the weights. The method can be illustrated by showing the steps involved in obtaining the weighted index for the textile products group for the month of May, 1925.

The second column of Table XV shows the May, 1925, index number for each industry, the third column, the weight assigned to each industry, and the fourth column, the product obtained by multiplying each index number by its corresponding weight. The total of the weight products in the third column, 2477.81, divided by 23.4, the sum of the weights, gives 105.9, the weighted index number for the group. The same method was followed in obtaining the monthly weighted index numbers for each group and for all manufacturing industries combined for the period from 1923 to 1927.*

Weighted Index for All Occupations

The methods described in this chapter have been used in the calculation of monthly index numbers of employment, on a 1923-

* For the years 1921 to 1923 the U. S. Employment Service collected monthly data on the number of wage earners employed in 122 factories in Pennsylvania, which makes possible the extension of the group indexes of employment back to January, 1921. These reports are not available for individual industries, but were classified into several groups of industries, most of which correspond to those used for the period from 1923 to 1927. The only exceptions were in the case of transportation equipment, in which the Employment Service did not include shipbuilding, and the leather and rubber products group, in which the Employment Service included only leather products. As the Employment Service figures comprise the reports of an identical group of firms for the entire three-year period they were first expressed as index numbers with the monthly average for 1923 as a base. The method was identical with that followed in computing the preliminary 1926-base index numbers for manufacturing industries. Since the two sets of group index numbers, *i. e.*, the 1923-base indexes for the period from 1921 to 1923, and the 1923-1925-base indexes for the period from 1923 to 1927 were available for one overlapping year (1923), the former set could be readily recomputed to a 1923-1925-base. This was accomplished by calculating for each group and for all industries combined the ratio of the 1923-1925 monthly average to the 1923 average and multiplying each monthly index for the earlier period by this percentage.

1925 base, for the following industries and trades for the periods designated:

All manufacturing industries	Jan., 1921, to Dec., 1927
Nine groups	Jan., 1921, to Dec., 1927
Fifty-one industries	Jan., 1923, to Dec., 1927
Consumers' goods	Jan., 1923, to Dec., 1927
Producers' goods	Jan., 1923, to Dec., 1927
Anthracite mining	Jan., 1921, to Dec., 1927
Transportation	Jan., 1921, to Dec., 1927
Construction	Jan., 1926, to Dec., 1927
Retail trade	Aug., 1923, to Dec., 1927
Wholesale trade	Aug., 1923, to Dec., 1927

During 1926 and 1927 practically all of the important industries and occupations of the state have been represented with what are believed to be fairly reliable samples showing monthly changes in employment. These industries employ about 75 per cent of the state's wage earning population, and, in the establishments which are now reporting monthly figures, nearly 30 per cent of the number engaged in these industries are employed. The information available and being currently collected was considered to be sufficiently accurate and adequate to permit the construction of an all inclusive index for Pennsylvania, which should give an indication of monthly changes in the total volume of employment. The method of constructing this index was substantially identical with that employed in the computation of index numbers for individual manufacturing industries and groups. The unweighted index was first calculated on a 1926 base by obtaining actual employment totals for each month; this series was then converted to the 1923-1925 base.

The weighted index was computed by multiplying the monthly index numbers for each of the main occupations, *i. e.,* manufacturing, anthracite mining, construction, transportation, retail trade, and wholesale trade, by the corresponding weights, adding these weight products for each month, and dividing by the sum of the weights. The weights were determined on the basis of the number of wage earners engaged in each occupation in 1925. For manufacturing and anthracite mining the Census provided

reliable figures on the number employed in that year, but for the other occupations, estimates were made on the basis of the 1920 Census of Occupations and certain supplementary information. Table XVI shows the estimated number employed in each occupation in 1925 and the weights used in the construction of the index of total employment.

TABLE XVI

SELECTION OF WEIGHTS FOR TOTAL EMPLOYMENT INDEX

Occupations	Estimated number of workers—1925	Selected weights			
		Jan., 1921–June, 1921	July, 1921–July, 1923	Aug., 1923–Dec., 1925	Jan., 1926–Dec., 1927
Manufacturing	999,000	76	71	63	58
Anthracite	160,000	12	11	10	9
Construction	270,000	----------	----------	----------	†8
Transportation	250,000	*12	18	16	15
Retail trade	130,000	----------	----------	8	8
Wholesale trade	40,000	----------	----------	3	2
Totals	1,849,000	100	100	100	100

* Employment for steam railroads was not available prior to June, 1921; therefore the transportation group was given weight assignable to transportation industries other than railroads.

† Owing to small size of construction sample this industry was given half the weight it would normally possess.

Both the unweighted, and the weighted, seasonally adjusted, indexes for total employment are shown in the Appendix, and, graphically, on Chart II. The annual index numbers, *i. e.*, monthly averages for each year for total employment and for the main occupations, as well as for the nine industrial groups comprising the manufacturing index, are shown in Table XVII.

Index numbers of wage payments for those industries and occupations for which information was available* were constructed by the same method used for employment, except that seasonally adjusted and weighted series were not computed.

* Wage payments were not reported for retail trade and wholesale trade; nor for manufacturing, prior to 1923.

The use of the methods described in this chapter has made it possible to translate the mass of primary data into a continuous record which provides a basis—not elsewhere available—for measuring changes in employment and wage disbursements in Pennsylvania from month to month and from year to year. The index numbers, constructed with every precaution against errors and inaccuracies, should constitute reliable indicators of employment trends and fluctuations in Pennsylvania, since the establishments reporting original figures are adequately representative of the industries in this state. However, in order to determine the extent to which these indexes will serve in measuring employment, and to discover ways in which they may serve as indicators of labor conditions, productive activity, purchasing power, and industrial and social conditions generally, brief analyses and evaluation will be made in the next chapter.

TABLE XVII

ANNUAL INDEX NUMBERS OF EMPLOYMENT IN PENNSYLVANIA

(Monthly averages of unweighted series for each year: 1923-1925 average=100)

Occupations and industries	1921	1922	1923	1924	1925	1926	1927
ALL OCCUPATIONS	86.3	85.0	106.8	98.6	94.6	98.5	96.0
MANUFACTURING	84.4	88.9	107.1	95.1	97.8	98.8	92.7
Metal products	72.8	81.9	108.0	97.3	94.8	95.4	88.0
Transportation equipment	99.1	102.9	115.2	90.8	94.0	97.7	87.8
Textile products	91.2	99.7	104.2	92.4	103.4	101.2	100.3
Foods and tobacco	99.0	107.5	104.1	98.5	97.3	97.3	96.3
Stone, clay and glass	74.0	90.7	103.1	100.2	96.6	98.0	93.5
Lumber products	88.1	95.7	100.1	97.5	102.5	93.6	84.7
Chemical products	90.1	87.2	103.8	97.9	98.3	109.0	101.0
Leather and rubber	105.9	114.6	108.6	96.0	95.4	95.7	97.0
Paper and printing	91.2	90.1	100.2	100.3	99.5	99.7	95.3
Producers' goods			109.0	94.8	96.2	97.6	90.4
Consumers' goods			103.5	96.2	100.3	100.4	97.3
ANTHRACITE MINING	109.7	67.2	107.2	114.0	78.8	101.2	117.9
CONSTRUCTION						127.1	97.3
TRANSPORTATION	84.5	92.6	104.0	99.8	96.2	97.2	93.5
RETAIL TRADE			99.7	100.5	99.8	101.3	101.0
WHOLESALE TRADE			100.4	99.7	100.0	99.4	99.0

CHAPTER IV

Analysis and Evaluation of Employment Fluctuations

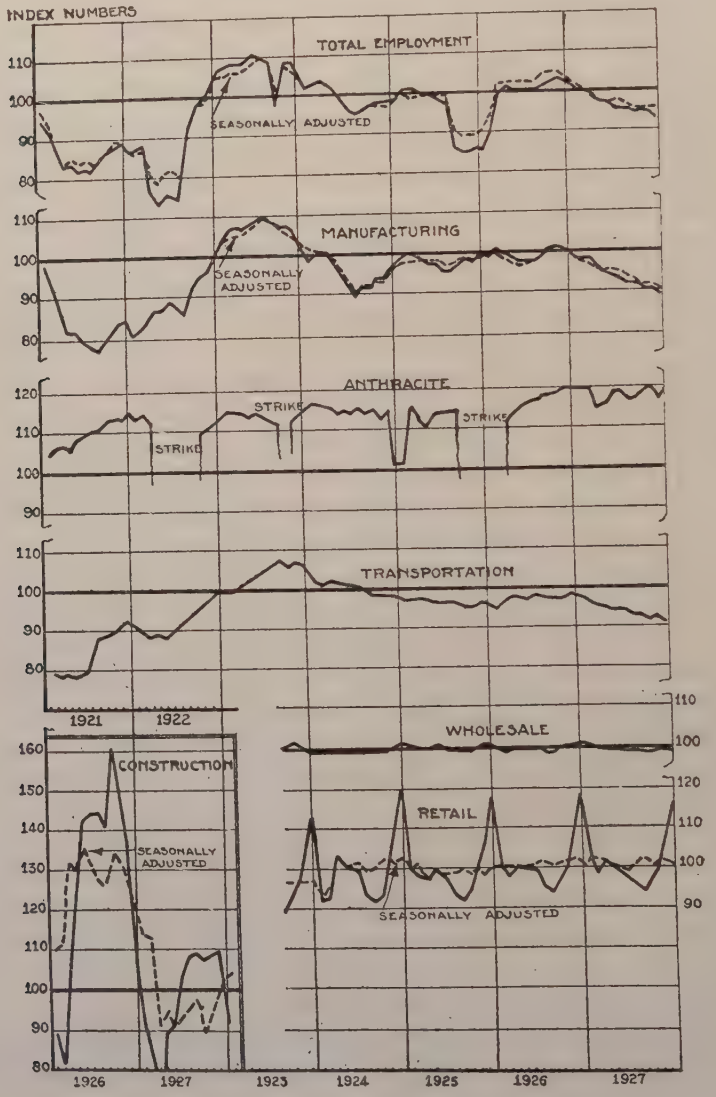
Industries generally show wide differences in their operations from period to period. The reasons for these divergent fluctuations are as numerous as they are obscure, and are often inexplicable. Inventions and improvements in mechanical processes, which enhance the efficiency of labor and management with a consequent increase in the volume of output, the migration of industrial plants in search for greater economies and advantages in production, the changing character of products manufactured and the periodic readjustment of factory equipment in an effort to keep abreast of changing demands, varying weather conditions which affect production and result in the concentration of consumers' demand at certain times of the year, strikes and many other more recondite causes are so interwoven that they make the search for an understanding of economic conditions and of the forces of the business cycle as difficult as it is necessary.

An inspection of Charts II, V, and VI will illustrate the diversity in trends which occur in various industries. Employment, as a whole, was at low levels in 1921 and 1922, rose sharply in the fall of the latter year and reached a high point in the spring and summer of 1923. During the ensuing 12 months a considerable decline ocurred, followed by a return to the somewhat higher levels which prevailed during 1925 and 1926, except for the period of the anthracite strike. Late in 1926 another decline commenced, which continued uninterruptedly throughout 1927 and brought the general employment level to a point nearly 20 per cent below the high point in 1923. The pronounced drops in the total employment curve in the summer of 1922, and in the fall of 1923 and 1925, were not cyclical declines, but were caused by the anthracite strikes during those periods.

Employment in this latter industry has not experienced the major fluctuations occurring in the manufacturing industries, but

CHART II

EMPLOYMENT FLUCTUATIONS IN PRINCIPAL OCCUPATIONS OF PENNSYLVANIA



except for the strike periods has shown a fairly steady upward trend during the entire seven years, not even being interrupted by seasonal variations. This steadiness in anthracite employment, however, is more apparent than real, since it furnishes no indication of the part-time work which prevailed, for instance, in 1927. In that year the payrolls of reporting collieries averaged 15.6 per cent lower than in 1926, except for the strike period, reflecting a curtailed demand for hard coal.

Employment in the manufacturing industries shows much the same characteristics as the total employment curve: rapid recovery from the 1921 depression, an equally rapid decline in 1924, followed by higher levels in 1925 and 1926 and a steady falling off during the next year.

In the transportation industries the rise from 1921 to 1923 was followed by a steady decline during the next two years and, after a slight increase in 1926, a continued recession during 1927.

The wholesale trades evidently enjoy employment conditions which are remarkably free even from seasonal fluctuations. During the period covered by this index, despite a very slight downward trend, the maximum variation has been less than three per cent.

In retail establishments the level of employment has shown little change from year to year, but a marked seasonal variation occurs in each year. Employment volume declines after the Easter buying season to a low level in the summer, increases again during the fall and reaches a sharp peak in December, reflecting the heavy volume of Christmas shopping in that month.

The most noticeable characteristic of the construction index, which covers only two years, is the pronounced seasonality in its fluctuations. During both 1925 and 1926 the number employed rose rapidly from very low levels in the winter to a seasonal peak in the fall. The seasonally adjusted index, however, shows a pronounced decline from 1925 to 1926.

Seasonal Variations in Employment

These seasonal variations in employment, which occur so markedly in retail establishments and in the construction industry,

also appear in most of the manufacturing industries. These "normal" seasonal fluctuations are so pronounced in many of the industries that they tend to obscure the long time trends and cyclical changes, and for that reason, the indexes have been "corrected" by the removal of these variations.

The nature and extent of these changes, however, in themselves possess considerable significance, for they provide some indication of the amount of surplus capacity, both of labor and capital equipment, resulting from seasonality of operations. They indicate which are the most active periods of the year, when these industries make the greatest demands for raw materials and bank credit necessary for their operations. Seasonal employment relatives have been derived for the industries which displayed a definite and determinable seasonal movement,* and the typical seasonal movement for each industry is shown, as monthly percentages of the average number of workers employed during the year, on Chart III and in Table XVIII.

The identical influences which explain the marked seasonality of employment in retail trade and the construction industry in large measure account for the seasonal operations manifest in many of the manufacturing industries. The busy season in the metal products and equipment industries comes in the late winter and early spring, when orders are received to supply the later needs of agriculture, the automobile, structural, and other metal consuming industries which are most active in the late spring and summer. Structural iron furnishes almost the only exception to this general trend; employment in this industry increases steadily through the year, reaching a high point in September, when building activity is at its height.

The seasonal variation of employment in the cement and lumber planing industries also reflects the demands of the building trades. Cement plants are naturally somewhat more active during the

* See Chapter III for description of method. Seasonality is quite apparent in the men's clothing, women's clothing, knit goods, and a few other industries, but the seasonal movement was so erratic during the period as to prevent its determination. In a few other industries, such as printing and publishing and paper and wood pulp, the seasonal movement, though evident, was so slight as to be of little significance.

CHART III

Seasonal Variations in Employment

(Typical monthly percentages of average number employed during year)

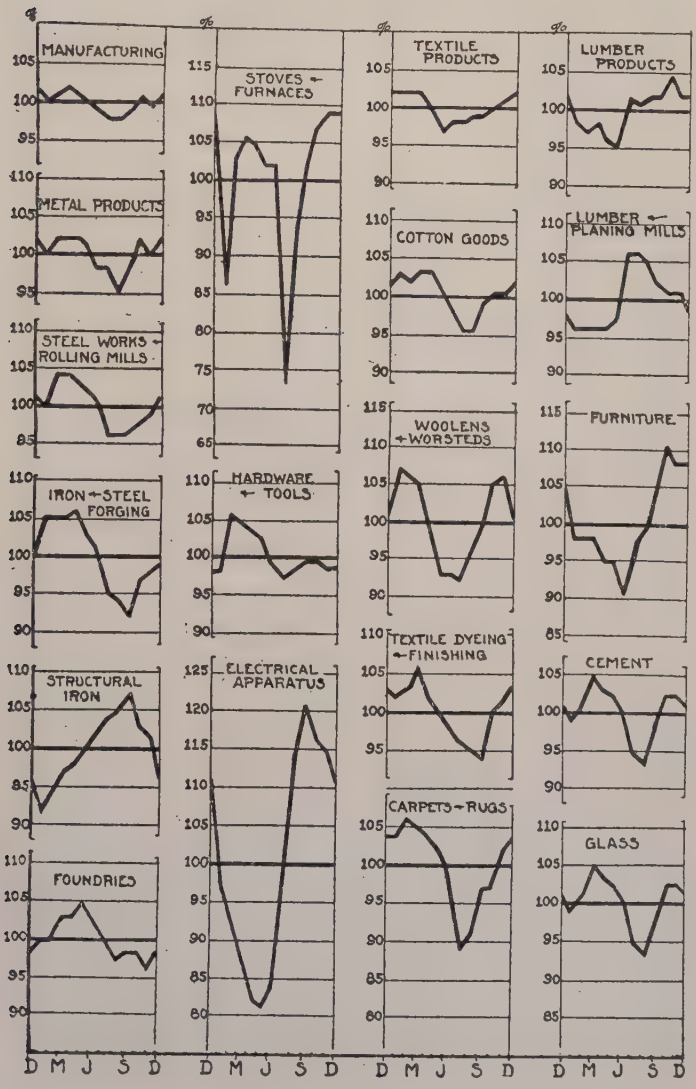


CHART III—*Concluded*

Seasonal Variations in Employment

(Typical monthly percentages of average number employed during year)

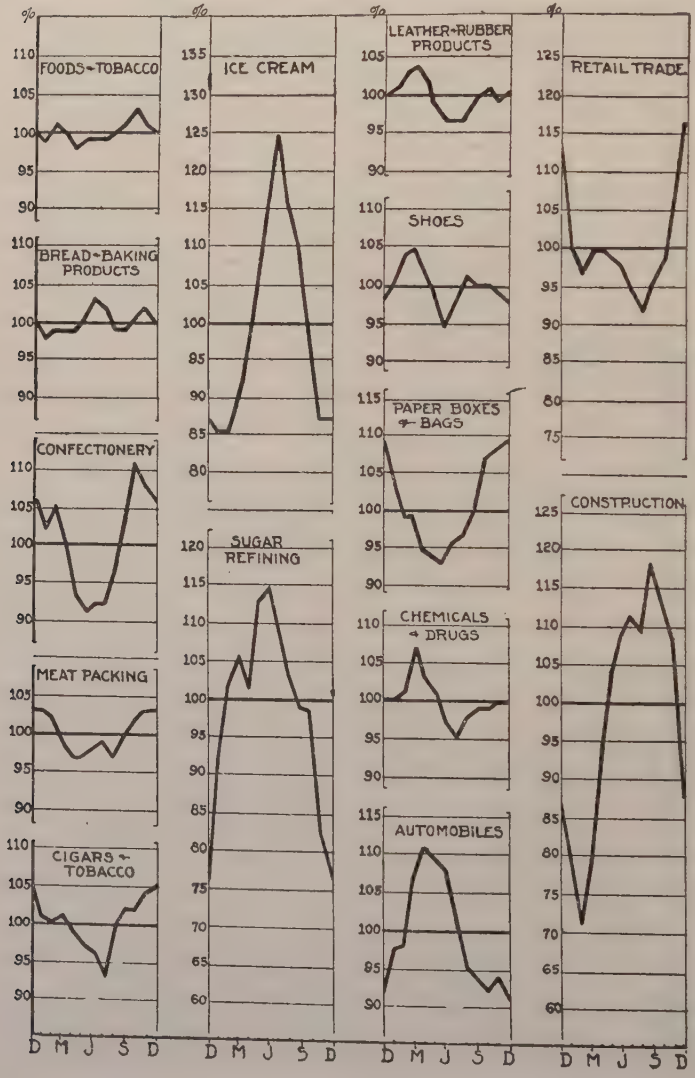


TABLE XVIII

Seasonal Variations in Employment

(Typical monthly percentages of average number employed during year)

Industries	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
ALL MANUFACTURING INDUSTRIES	100	101	102	101	100	99	98	98	99	101	100	101
METAL PRODUCTS	100	102	102	102	101	98	98	95	98	102	100	102
Steel works and rolling mills	100	104	104	103	102	100	96	96	97	98	99	101
Iron and steel forgings	105	105	105	106	103	101	95	94	92	97	98	99
Structural iron work	92	94	97	98	100	102	104	105	107	103	102	96
Stoves and furnaces	86	103	106	105	102	102	74	95	102	107	109	109
Foundries	100	100	103	103	105	102	100	97	98	98	96	98
Electrical apparatus	97	92	87	82	81	84	100	114	121	116	115	111
Hardware and tools	98	105	104	103	102	99	97	98	99	99	98	98
Automobiles	98	98	107	111	110	108	101	95	94	92	94	92
TEXTILE PRODUCTS	102	102	102	100	97	98	98	99	99	100	101	102
Cotton goods	103	102	103	103	101	98	95	95	99	100	100	101
Woolens and worsteds	107	106	105	98	93	93	92	95	99	105	106	101
Textile dyeing and finishing	102	103	106	102	100	98	96	95	94	100	101	103
Carpets and rugs	104	106	105	104	102	99	89	91	97	97	102	104
FOODS AND TOBACCO	99	101	100	98	99	99	99	100	101	103	101	100
Bread and bakery products	98	99	99	99	100	103	102	99	99	100	102	100
Confectionery	102	105	100	93	91	92	92	96	104	111	108	106
Ice cream	85	85	89	97	106	117	125	115	110	97	87	87
Meat packing	103	102	99	97	97	98	99	97	100	102	103	103
Sugar refining	93	102	106	102	113	115	110	103	99	99	82	76
Cigars and tobacco	101	100	101	99	97	96	93	100	102	102	104	105
Cement	98	98	97	99	101	101	102	102	101	101	101	99
Glass	99	101	105	103	102	100	94	93	98	102	102	101

TABLE XVIII—*Concluded*

Seasonal Variations in Employment

(Typical monthly percentages of average number employed during year)

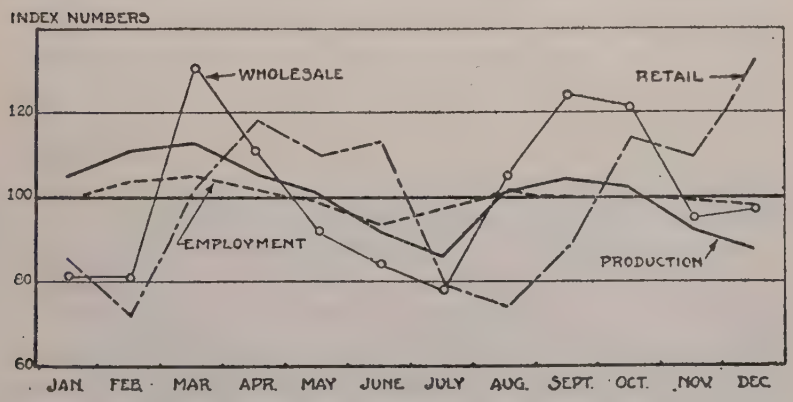
Industries	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
LUMBER PRODUCTS	98	97	98	96	95	102	101	102	102	105	102	102
Lumber and planing mills	96	96	96	96	97	106	106	105	102	101	101	98
Furniture	98	98	98	95	95	90	97	99	104	110	108	108
Chemicals and drugs	100	101	107	103	101	97	95	98	99	99	100	100
LEATHER AND RUBBER PRODUCTS	101	103	104	102	98	97	97	98	100	101	99	100
Shoes	100	104	105	102	99	94	98	101	100	100	99	98
Paper boxes and bags	103	99	99	95	94	93	96	97	100	107	108	109
CONSTRUCTION	81	72	81	94	105	110	113	111	120	115	109	89
RETAIL TRADE	100	97	100	100	99	98	94	92	96	99	108	117

summer and fall, although the large storage capacities for this standardized product make possible fairly steady employment throughout the year. The active season for planing mills arrives in mid-summer, when the buildings commenced in the spring are ready for the installation of mill-work. Glass production reaches a maximum in March, reflecting the demand for these products from the automobile and building industries.

In the textile, apparel, food, and other industries, which produce finished or nearly finished goods ready for sale, the seasonal buying habits of the ultimate consumer, which are responsible for the fluctuations in retail trade, become most apparent. The heavy concentration of retail buying in the Christmas season is reflected, in the fall, in the marked seasonal expansion of such industries as the manufacture of cigars, confectionery, furniture, paper boxes, and electrical apparatus. The shoe and textile industries also respond to the influence of the Christmas season, although these industries are most active during the late winter and early spring producing goods to be sold in the Easter season.

CHART IV

SEASONALITY IN PRODUCTION AND DISTRIBUTION OF SHOES



These industries, as well as most of the others producing consumers' goods, in recent years have been compelled to operate on "hand-to-mouth" schedules, filling small orders for immediate delivery. Frequent style changes have made it difficult to operate "one season ahead," by manufacturing goods for stock, or for delivery several months in the future. This close adjustment of production to wholesale and retail distribution, and the resultant seasonality, can be illustrated by reference to Chart IV, which shows the typical seasonal variations in employment and production, and in the wholesale and retail sales of shoes in Pennsylvania. Seasonal peaks in production and in wholesale distribution occur in the same months, March and September, while retail sales lag behind by only one or two months.

The whims of the consumer, even when stimulated by advertising and merchandising practices, are of course not alone responsible for the marked seasonality in the operations of so many industries. The tremendous volume of Christmas purchasing, it is true, is a commercialized outgrowth of long established custom and is not truly seasonal in its nature, as it does not reflect demands arising from passing seasons. But in most cases, established buying habits grow out of the actual changes in weather conditions which accompany the changing seasons. Seasonal changes in weather conditions not only are responsible for the seasonal characteristics of out-door activities such as construction work, but also cause variations in the supply of raw materials, which partially accounts for the seasonality of such industries as sugar refining, meat packing and canning.

The seasonal unemployment of labor and equipment places a heavy overhead burden upon industry, one which may indeed be more costly than that resulting from cyclical depressions. Although the extreme seasonal decline in manufacturing employment as a whole amounts to less than four per cent from the peak in March to mid-summer, this evidently understates the full effects of seasonal unemployment, for most of the separate industries experience a much wider variation, and it seems improbable that all or most of the employes released in one industry during the dull season immediately find employment in other

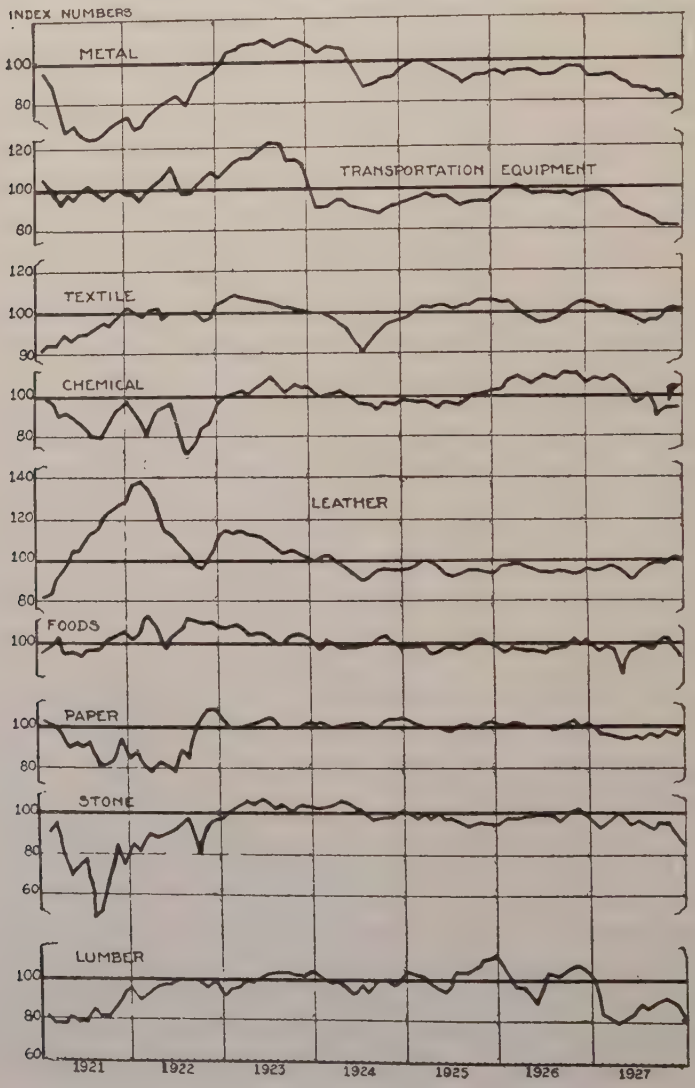
seasonally active industries. Undoubtedly there is considerable shifting of casual labor released from manufacturing plants in the late spring to the various out-door occupations which commence at that time. Nevertheless, at all periods of the year there is probably a certain proportion of industry's wage earners who are idle for seasonal reasons, while the seasonal unemployment of machinery must be much greater, since there can be little or no shifting of specialized productive equipment from one industry to another.

Seasonal unemployment among building workers, which in the winter months amounts to from a third to a half of the total number engaged in the industry, is a matter of common knowledge. In the manufacturing industries there is little evidence as to whether or not most of those seasonally unemployed in one industry find work in the establishments of some other industry. In the furniture industry, for instance, out of every 110 men employed in October, the most active month, only 98 are on the rolls in January, February and March, and 90, in the dull month of June. If the October rate of operations were maintained throughout the twelve months of the year, these 110 wage earners would work a total of 1,320 "employe-months." But under present seasonal operating conditions, this group of workers would normally lose a total of 120 "employe-months"—the equivalent of more than nine per cent unemployment throughout the year—a considerable burden of idle overhead for an industry which employs some 12,000 workers and represents a capital investment of more than $35,000,000. Many of the employes in highly seasonal industries undoubtedly find work elsewhere in the dull seasons, and in the case of some products, particularly confectionery and ice cream, manufacturers have been able to "dovetail" their operations by producing commodities which have opposite or compensating seasonal tendencies.

The whole question of the nature and extent of seasonal unemployment, and of its causes and effects, is evidently one of vital importance to both the employers and wage earners. The existing causes of seasonal operations and hence of seasonal employment are not hard to discover, but the actual effects of this recurrent

CHART V

EMPLOYMENT FLUCTUATIONS IN PRINCIPAL GROUPS OF MANUFACTURING INDUSTRIES



seasonality upon labor and capital and the correctives which have been or might be applied to the situation constitute a field for further investigation which may bring forth illuminating results.

Characteristics of the Manufacturing Indexes

When divested of this recurrent seasonal variation, employment in manufacturing, which is the most important component of the total index, shows two distinct cyclical movements during the seven-year period covered by the index. The rise from the extreme low point in August, 1921, to the high level of 1923 was followed by a sharp decline of 18 per cent to July, 1924—practically three years after the turning point of the previous depression period. This decline was followed by a prompt, but only partial, recovery and the maintenance of a steady employment level until the last quarter of 1926, when the index again turned downward, declining 13 per cent by the end of 1927.

Not all of the industries composing the index, however, shared in these movements to an equal extent. The paper and printing, stone, clay and glass, and food and tobacco industries generally maintained a very stable level of employment during the entire five years, while the leather and rubber group has only recently experienced appreciable expansion from the 1924 level. In the lumber products and chemical groups the 1923 rise was not pronounced, and higher levels than in that year were reached in 1925 and 1926, in contrast to the situation in manufacturing as a whole. The three principal groups included in the index—metal products, transportation equipment, and textile products—all reflect the cyclical decline from 1923 to 1924 and the subsequent recovery, although the textile industries have not shared in the uninterrupted decrease which occurred in 1927.

Employment fluctuations in producers' and consumers' goods industries

The majority of the 52 industries included in the index have not at any time since 1923, even in the active business years of 1925 and 1926, employed as many workers as were engaged in

CHART VI

EMPLOYMENT FLUCTUATIONS IN SEPARATE MANUFACTURING INDUSTRIES

(Original index———; seasonally adjusted index – – – –)

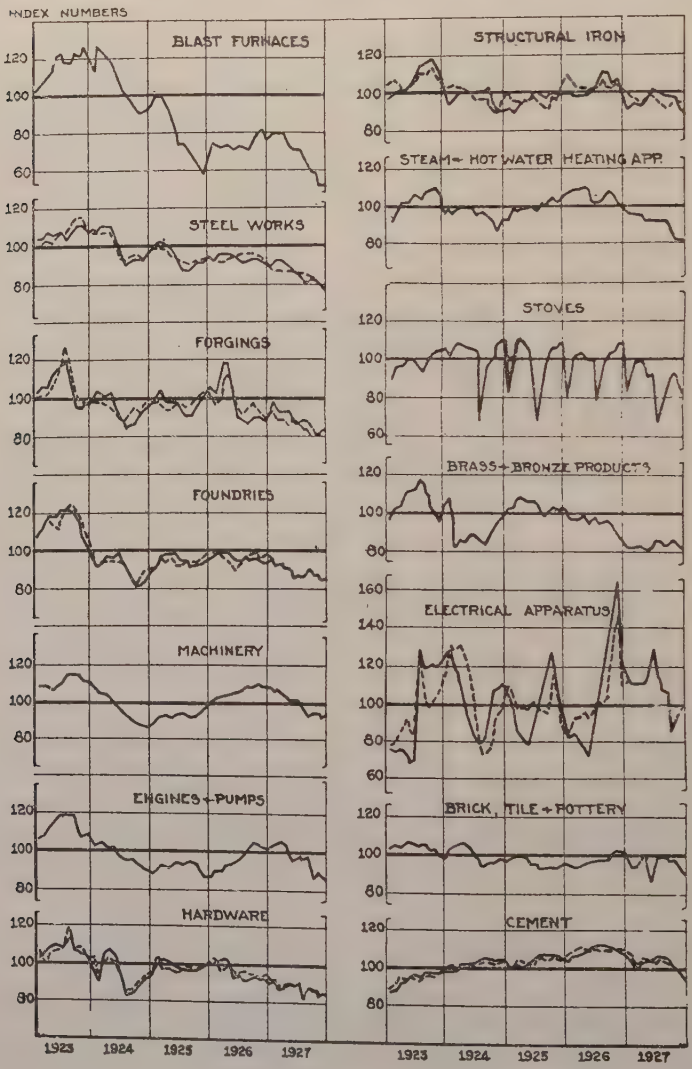


CHART VI—*Continued*

EMPLOYMENT FLUCTUATIONS IN SEPARATE MANUFACTURING INDUSTRIES

(Original index———; seasonally adjusted index – – – –)

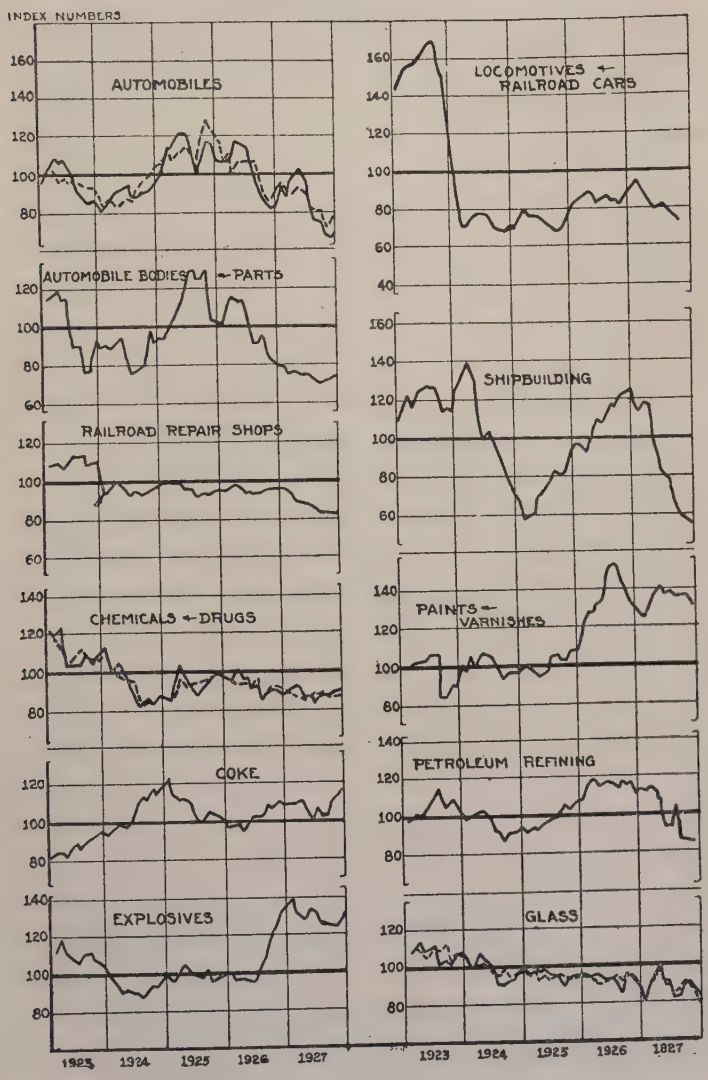


CHART VI—*Continued*

EMPLOYMENT FLUCTUATIONS IN SEPARATE MANUFACTURING INDUSTRIES

(Original index———; seasonally adjusted index - - - -)

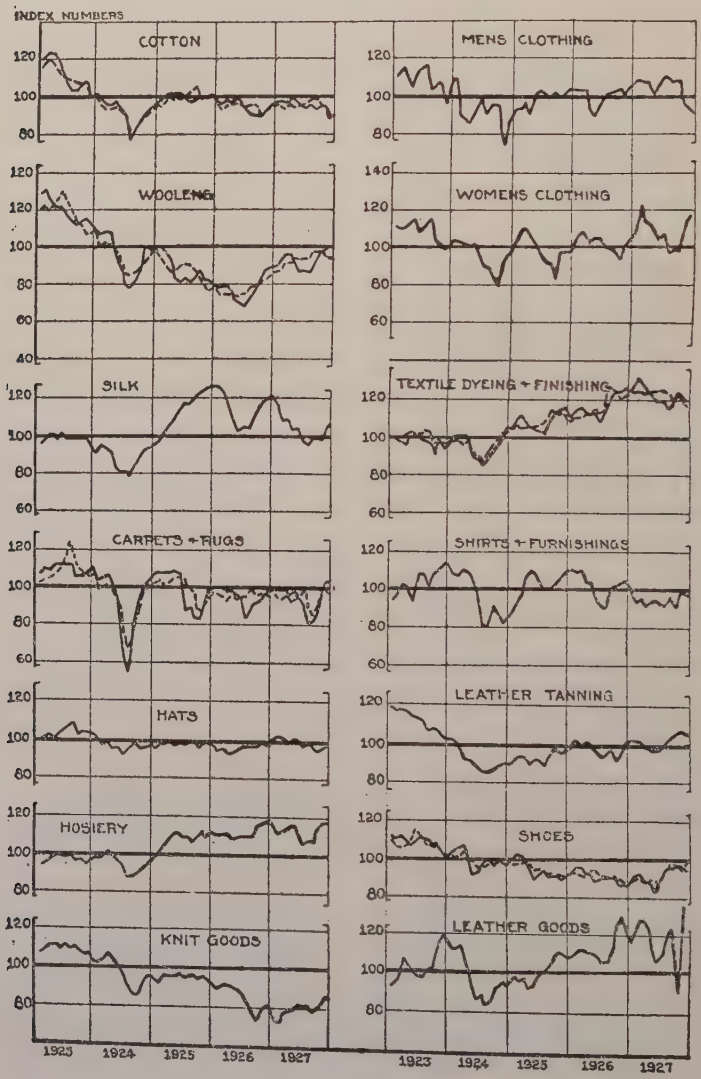
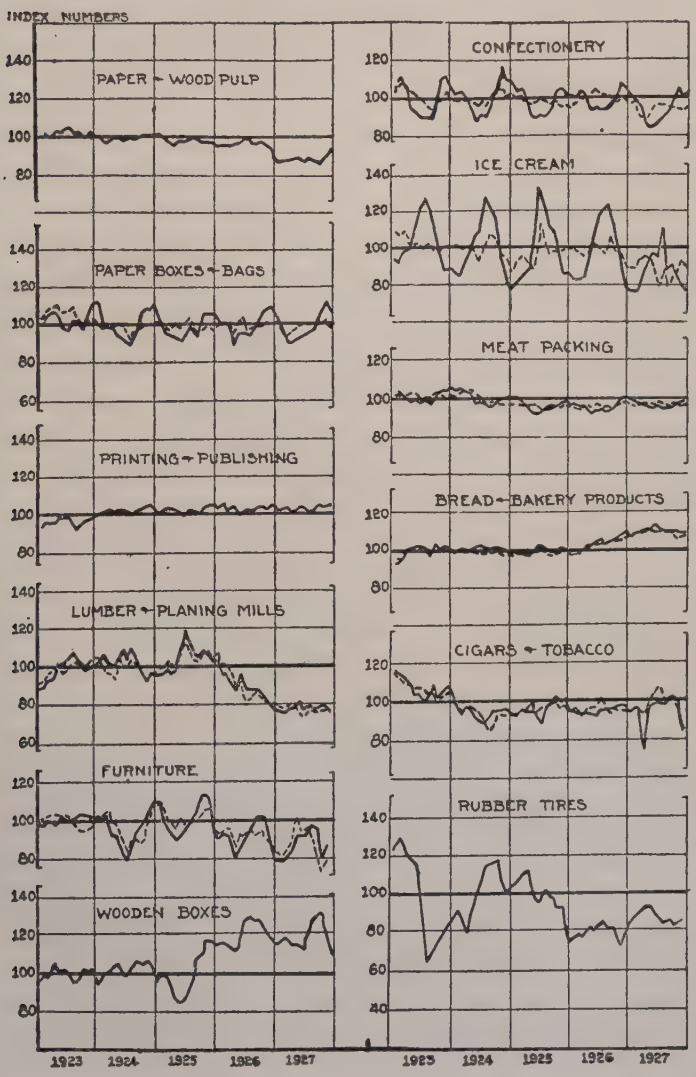


CHART VI—*Concluded*

EMPLOYMENT FLUCTUATIONS IN SEPARATE MANUFACTURING INDUSTRIES

(Original index———; seasonally adjusted index - - - -)



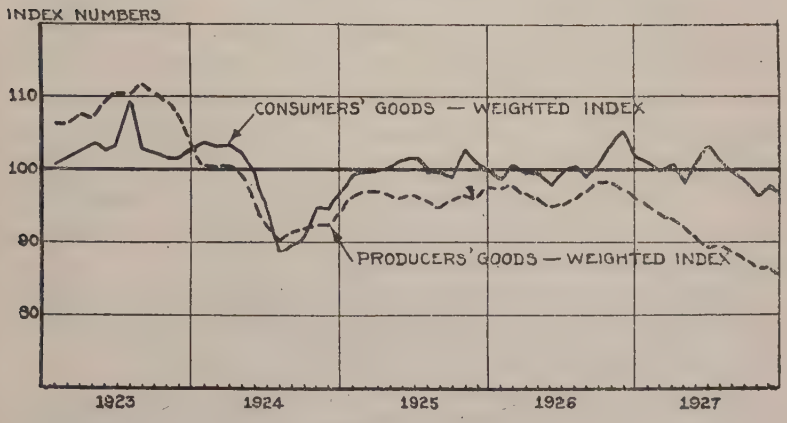
that year. Generally speaking, manufacturers of iron and steel products, engines, machinery, and railroad equipment experienced the most severe declines both in 1924 and in 1927, while the automobile, silk, hosiery, cement, furniture, electrical apparatus, baking, printing and publishing, and petroleum refining industries have been striking exceptions to these cyclical recessions and to the general downward tendency. An examination of Chart VI shows that most of the industries producing finished goods ready for consumption, though experiencing pronounced seasonal fluctuations, have been less affected by cyclical changes than have the machinery and equipment industries. This apparent divergence has been tested by the computation of weighted indexes of employment in "producers' goods" and "consumers' goods" industries. Each of the 52 industries was included in one or the other of these two groups, according to whether its products were destined for further use in productive or distributive activity or were in the final form ready for purchase by the retail consumer.* The fluctuations of the two groups as indicated in Chart VII show marked divergences. The producers' goods group experienced a substantial decline from the 1923 peak, recovered slightly in the next two years, and after the last quarter of 1926, suffered a further severe and uninterrupted decline which, by the end of 1927, brought the employment level in these industries to a point more than five per cent below the low level of 1924. The consumers' goods industries, on the other hand, experienced a later

* The following industries were included in the producers' goods group: blast furnaces, steel works and rolling mills, iron and steel forgings, structural iron work, steam and hot-water heating appliances, foundries, machinery and parts, engines and pumps, brass and bronze products, automobile bodies and parts, locomotives and cars, railroad repair shops, shipbuilding, woolens and worsteds, silk goods, textile dyeing and finishing, brick, tile and pottery, cement, glass, lumber and planing mills, wooden boxes, chemicals and drugs, coke, explosives, leather tanning, paper and wood pulp, paper boxes and bags. The consumers' goods group included: stoves and furnaces, electrical apparatus, hardware and tools, automobiles, cotton goods, carpets and rugs, hats, hosiery, other knit goods, men's clothing, women's clothing, shirts and furnishings, bread and bakery products, confectionery, ice cream, meat packing, sugar refining, cigars and tobacco, furniture, paints and varnishes, petroleum refining, shoes, other leather products, rubber tires and goods, and printing and publishing.

and less severe cyclical decline in 1924, returned to relatively higher levels in 1925, and subsequently maintained their employment volume only slightly below the 1923 level.

CHART VII

EMPLOYMENT FLUCTUATIONS IN CONSUMERS' GOODS AND PRODUCERS' GOODS INDUSTRIES



Any explanation of this marked disparity between the trends of the two groups, in the absence of a careful investigation of conditions in specific industries and in particular establishments, can be only conjectural. It seems probable, however, that makers of consumption goods, being "closer" to their ultimate purchasers, are more readily able to adjust the size of the working force and their production schedules to actual demand. Moreover, the perishability of some of these products and frequent style changes prevent their manufacture for future delivery or for stock. Furthermore, it is a well-established fact that the volume of retail trade, since it represents purchasing for consumption rather than speculative buying, fluctuates only slightly from prosperity to depression; much less than the volume of wholesale trade or the buying of raw materials and equipment.

Manufacturers of producers' goods, on the contrary, are making products which may go through several further productive

processes before they reach the retail market. Further, most of these products are not perishable nor subject to depreciation through style changes; hence they can be produced or purchased for storage in anticipation of future needs or higher prices. These industries, therefore, are more likely to suffer from the cyclical booms and depressions which result from underestimating or overestimating the ultimate market for their products.

These factors may account for the different cyclical characteristics of these two types of industry, but they cannot explain the fact that the producers' goods group failed, at any time after 1924, to recover more than a fraction of the decline which commenced in 1923. This failure is partially attributable to the fact that some of the largest of these equipment industries, such as the manufacture of locomotives and railroad cars, shipbuilding, and iron and steel plants, have suffered from a prolonged curtailment of business and of operations since 1923.

Another factor which may have had a great influence on the volume of employment in the metal and equipment industries is the extraordinary mechanization of productive operations and improvement of management technique which has made possible great increases in the output per worker. This means that fewer workers are needed now to produce the same output than was the case five years ago. In most of the industries producing consumers' goods, however, such improvements have not been as extensively introduced, so that more stable employment conditions have continued to exist in the latter type of industry.

Employment fluctuations in large and small plants

The question of the relative stability of operations and employment in factories of various size has attracted considerable interest in recent years, owing to the rapid decline in the number of small establishments and in the number of workers employed in these plants and the fast growing importance of the large establishments. This question, moreover, is of particular importance in evaluating the employment indexes for Pennsylvania because the reports upon which they are based are necessarily

obtained chiefly from establishments employing more than 100 wage earners. Less than two per cent of the workers represented in the manufacturing indexes in 1925 were employed in plants having less than 50 workers, and three per cent in establishments employing between 50 and 100 workers.* Contrasted with this distribution is the fact that nearly 19 per cent of the workers engaged in manufacturing in the United States in 1923, were employed in plants with less than 50 workers, while over nine per cent worked in factories employing more than 50 and less than 100 wage earners. No comparable Census figures are available for Pennsylvania but since the average size of the reporting establishments was more than four times as large as that of all factories in the state, it is clear that the index is overweighted with the large establishments.

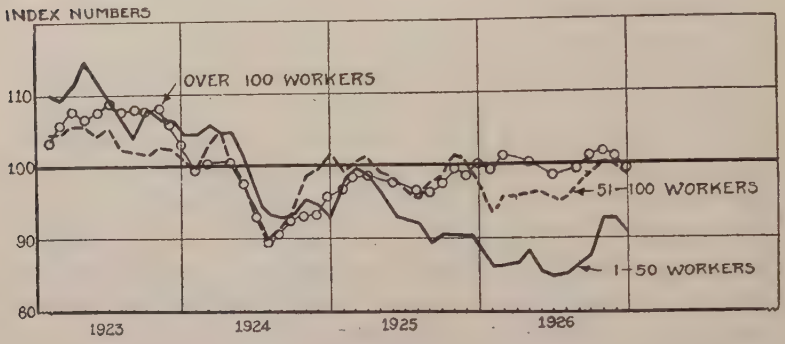
In order to determine whether this relative overweighting with the large establishments would tend to distort the manufacturing indexes in any way, an analysis was made of the employment fluctuations in establishments of different size. Monthly totals of the number of workers on the rolls of reporting establishments which, in 1925, employed less than 50 wage earners, were obtained for each month of the period from 1923 to 1926, inclusive. Similar data were obtained for establishments employing from 51 to 100 workers, and for those employing over 100 wage earners.† The final totals, which were expressed as index numbers on a 1923-1925-base, are shown on Chart VIII.

* See Table V.

† This study was made under my supervision by Mr. John Hanna, a senior research student at the Wharton School of Finance and Commerce. In the 1-50 group, 208 firms employing about 6,000 workers were included; 136 firms with 10,000 workers are represented in the 51-100 group, and the largest group comprises the reports of 552 firms and 300,000 workers. A few firms in each group did not report continuously throughout the entire four-year period. In the case of those establishments which discontinued reporting before the end of the period the last employment total reported was used for subsequent months. While for the firms which commenced reporting subsequent to January, 1923, the first employment total reported was used for the months prior to the time when their first reports were received. This treatment has little influence on the final series, as evidenced by the fact that fluctuations in the different size groups correspond closely to the range covered by the employment index for manufacturing industries.

CHART VIII

EMPLOYMENT FLUCTUATIONS IN LARGE AND SMALL PLANTS



Apparently there is little substantial difference in the extent to which the volume of employment in the different groups fluctuates from month to month. All three groups reflect the cyclical decline from the spring of 1923 to the late summer of the following year and the smaller recovery which occurred subsequently. Employment in the plants with more than 100 workers on their rolls declined from 312,772 in the spring of 1923 to 254,172 in July, 1924, or 17.5 per cent, while the smallest establishments discharged 19.3. per cent of their workers during this period. The recovery which had occurred by the spring of 1925 amounted to 10.4 per cent in the largest plants, 10.7 per cent in the smallest plants, and 11.2 per cent for the group which employed from 51 to 100 workers. During 1925 and 1926, a fairly stable level of employment was maintained in the large establishments, while the smaller plants showed a slight downward tendency, reflecting the fact that a relatively larger number of these small establishments discontinued operations during this period. The data available for this study are probably too scant, and the period covered too short, to justify any definite conclusions.* However,

* These results are somewhat at variance with those reached by W. I. King in *Employment Hours and Earnings in Prosperity and Depression*, published by the National Bureau of Economic Research. Dr. King's conclusions were that, during the period from the first quarter of 1920

it seems probable that no very great bias has been introduced into the employment index numbers by the inclusion of a relatively heavy proportion of large establishments.*

Reliability of the Indexes

Any value and usefulness which the employment and payroll indexes may possess depend, in the first instance, upon whether or not they actually measure the employment changes in the industries and occupations they are intended to represent. With few exceptions they are based upon what are believed to be adequate proportions of the total employment in each industry, and, in most cases, the reporting establishments are well distributed throughout the state. Although most of the reports are received from the larger establishments, it is believed that this disproportionate representation introduces no substantial bias into the data.

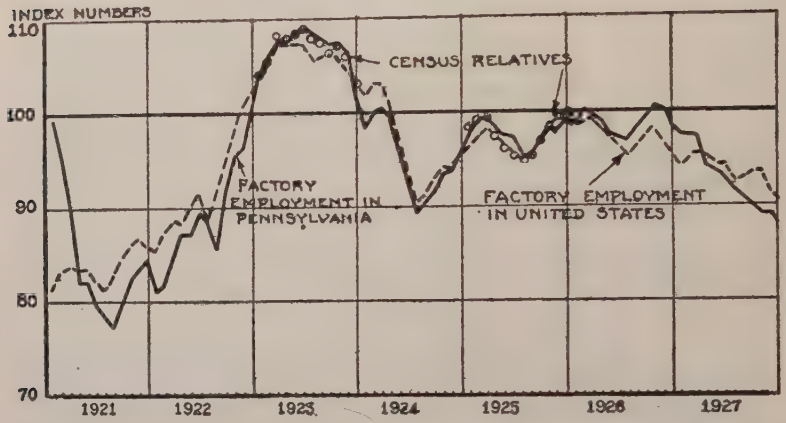
Moreover, the probable reliability of the employment indexes for manufacturing industries can be substantiated by comparing them with the actual employment fluctuations for the entire industry in 1923 and in 1925. The Census of Manufactures, taken in each of these years, shows the number of workers on the rolls of all establishments in a representative payroll period of each month. A measure is thus furnished of the monthly employment fluctuations for most of the important industries of the state. These Census relatives for manufacturing, shown in Chart IX, conform very closely to the employment index numbers for practically every month in these two years. In only six of the 24 months covered by the comparison was the divergence as great as one per cent, while the average difference was only five-

to the first quarter of 1922, the smaller establishments enjoyed greater stability than did the large plants. This study of Pennsylvania factories indicates that any slight difference that does exist points to a somewhat greater stability in the large establishments.

* "Replying to your final paragraph: It is not believed that the data for the establishments employing small numbers of wage earners have any great effect on the percentages which the minimum month forms of the maximum, for manufacturing industries in general."—From letter of W. M. Steuart, Director of the Census, Department of Commerce, Washington, D. C.; July 25, 1927.

CHART IX

COMPARISON OF FACTORY EMPLOYMENT IN PENNSYLVANIA WITH CENSUS RELATIVES AND WITH FACTORY EMPLOYMENT IN THE UNITED STATES



tenths of one per cent. Probably the two series would correspond even more closely were Census relatives available for all of the industries which are included in the index.* Furthermore, since the Census shows data for a "representative" payroll period in each month, while the index numbers are based upon reports for the payroll period ending nearest the 15th day of the month, the divergence in the December and January figures is probably attributable to an actual lessening of employment in the inventory period, which is shown by the index, but not by the Census relatives.† It seems reasonable to conclude, on the basis of this

* For the following industries, included in the index, no monthly Census relatives were available: iron and steel forgings, structural iron work, steam and hot-water heating apparatus, foundries, machinery and parts, hardware and tools, hats, shirts and furnishings, cigars and tobacco, wooden boxes, chemicals and drugs, coke, leather products, and paper boxes and bags.

† "You are probably correct in your belief that a manufacturer in reporting to the Bureau of the Census for the months of December and January is likely to select a day of comparatively full employment as the 'representative day,' rather than a date on which a large proportion of the employes have been temporarily laid off because of inventory taking." —From letter of W. M. Steuart, Director of the Census, Department of Commerce, Washington, D. C.; August 1, 1927.

evidence that this unweighted series, though based upon the reports of only 900 of the larger establishments among a total of more than 17,000, provides a thoroughly reliable and accurate measure of changes in the volume of factory employment in Pennsylvania.

That the manufacturing industries of this state constitute a remarkable industrial cross-section of the entire country is also apparent from the close correspondence between the Pennsylvania index and that for the United States.* Although the Pennsylvania index covers less than four per cent of the total number of factory workers in the United States it appears to reflect fairly closely employment changes in the entire country. As many of the indexes for separate industries show an even closer correspondence, it seems probable that industrial operations are uniform throughout a given industry despite the geographic separation of the various producing units.

The reliability of most of the index series for individual industries was tested similarly by comparing their fluctuations with the monthly Census relatives for the years 1923 and 1925. In most cases the two series were found to correspond closely. Coefficients of correlation between the several employment indexes and the corresponding Census relatives, shown in Table XIX, indicate in a general way the relation between the two series, although it must be realized that a correlation coefficient between two time series for such a short period as twelve months is subject to considerable error and, moreover, furnishes no indication of the extent or "amplitude" of fluctuation in the two series. Furthermore, the Census relatives themselves, as has been explained, are not always accurate measures of employment changes. In several of the smaller industries, however, notably men's clothing, women's clothing, paints and varnishes, and explosives, the correlations with the 1925 Census data were so small as to indicate that the indexes for these industries are based upon

*This index has been prepared by the Division of Research and Statistics of the Federal Reserve Board on the basis of monthly reports to the Bureau of Labor Statistics from some 10,000 factories employing nearly 3,000,000 wage earners in all parts of the United States. The coefficient of correlation between the two series for the seven-year period was +.90.

TABLE XIX

CORRELATION BETWEEN EMPLOYMENT INDEX NUMBERS AND CENSUS RELATIVES

Industries	1923		1925	
	Coefficient of correlation*	Probable error	Coefficient of correlation*	Probable error
ALL MANUFACTURING INDUSTRIES	.95	.02	.89	.04
Blast furnaces	.89	.04	.80	.07
Steel works and rolling mills	.17	.19	.83	.06
Stoves and furnaces			.92	.03
Electrical apparatus	.85	.05	.74	.09
Engines and pumps			.81	.07
Brass and bronze products	.71	.10		
TRANSPORTATION EQUIP'T	1.00	.00	.87	.05
Automobiles	.59	.13	.48	.15
Automobile bodies and parts	.61	.12	.54	.14
Locomotives and cars	.98	.01	.71	.10
Railroad repair shops	.98	.01	.98	.01
Shipbuilding	.95	.02	.93	.03
TEXTILE PRODUCTS	.89	.04	.85	.05
Cotton goods	.76	.08	.46	.15
Woolens and worsteds	.87	.05	.87	.05
Silk goods	.58	.13	.98	.01
Textile dyeing and finishing	.76	.08	.93	.03
Carpets and rugs	.81	.07	.97	.01
Hosiery	.80	.07	.91	.03
Knit goods, other	.09	.19	.58	.13
Men's clothing	—.06	.19	.50	.15
Women's clothing	.46	.15	.75	.09
Bread and bakery products	.82	.06	.58	.13
Confectionery	.89	.04	.92	.03
Ice cream	.93	.03	.98	.01
Meat packing	.76	.08	.96	.02
Sugar refining	.89	.04	.81	.07
STONE, CLAY AND GLASS PRODUCTS	.76	.08		
Brick, tile and pottery	.46	.15		
Cement	.98	.01	.89	.04
Glass	.90	.04	.74	.09
LUMBER PRODUCTS	.70	.10	.73	.09
Lumber and planing mills	.97	.01	.71	.10
Furniture	.60	.12	.94	.02

TABLE XIX—*Concluded*

CORRELATION BETWEEN EMPLOYMENT INDEX NUMBERS AND CENSUS RELATIVES

Industries	1923		1925	
	Coefficient of correlation*	Probable error	Coefficient of correlation*	Probable error
Explosives	.72	.09	.05	.19
Paints and varnishes	.82	.06	—.79	.07
Petroleum refining	.83	.06	.76	.08
Leather tanning	.94	.02	.80	.07
Shoes	.87	.05	.95	.02
Rubber tires	.97	.01	.53	.14
Paper and wood pulp	.73	.09	.51	.14
Printing and publishing	.47	.15	.82	.06

* Pearsonian coefficient of correlation; correlation is positive except where otherwise indicated.

inadequate and unrepresentative samples. But in general it was found by actual comparisons that these indexes correspond closely to the Census relatives and therefore constitute dependable indicators of the trend of employment and wage payments in the various manufacturing industries.

The reliability of the indexes for transportation, anthracite mining, construction, retail, and wholesale trade cannot be directly tested, since no comparable data are available, but the reports for these occupations are sufficiently widespread and cover an adequately large proportion of the total employment in most cases,* to indicate that they are also dependable.

RELATION OF EMPLOYMENT AND WAGE INDEXES TO OTHER ECONOMIC DATA

Assuming that these indexes present a dependable record of the monthly changes in employment and payrolls of the principal industries and occupations of Pennsylvania during the last seven years, what value and significance do they possess in the meas-

* The sample available for the construction index is somewhat inadequate. See Chapter II.

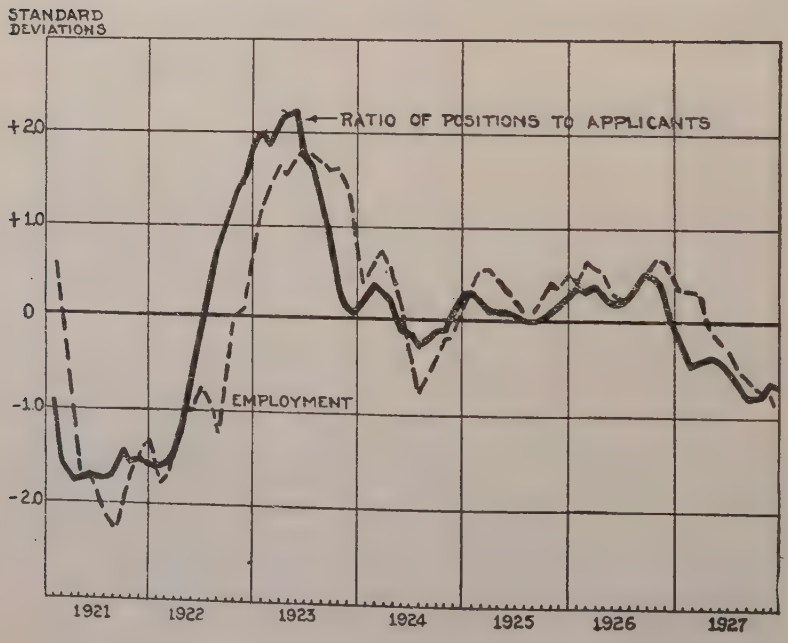
urement and interpretation of social and economic conditions during that period? Do the employment and wage payment indexes reflect changes in productive activity and in general business conditions? How may they be used in estimating the extent of unemployment and conditions in the labor market? In what way are they related to the purchasing power of the population and to the use of credit and currency in financing the production and sale of commodities?

Employment fluctuations and labor market conditions

Since the employment indexes measure changes in the number of workers on the payrolls of reporting establishments they should be closely related to the extent of unemployment and to

CHART X

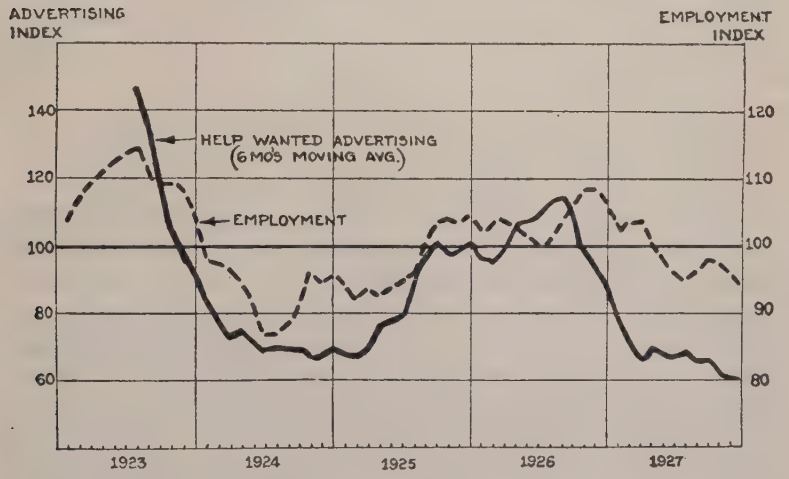
COMPARISON OF RATIOS OF POSITIONS TO APPLICANTS AT PUBLIC EMPLOYMENT OFFICES WITH FACTORY EMPLOYMENT IN PENNSYLVANIA



changes in the demand for and supply of labor. For this reason, the employment index possesses particular usefulness to the Department of Labor and Industry, which is responsible for the operation of public employment offices throughout the state. The Department has kept a record for several years past of the operations of these employment offices, showing the number of workers who applied for work each month and the number of positions offered by employers. The actual changes in these totals are of somewhat dubious statistical value, owing to certain

CHART XI

COMPARISON OF EMPLOYMENT FLUCTUATIONS WITH NEWSPAPER HELP WANTED ADVERTISING IN PHILADELPHIA



changes in the methods of keeping these records, but the relation between the number of applicants for jobs each month and the number of positions vacant should furnish an indication of changes in the demand for and supply of labor. These monthly ratios of positions to applicants, expressed as index numbers on a 1923-1925 base, are shown in Chart X in comparison with the employment index for manufacturing industries.*

* The manufacturing index was believed to be more comparable with these ratios than the total employment index, since most of the workers

It is noticeable that both curves show quite similar general characteristics, rising from the low levels of 1921 to high points in 1923, then declining sharply and maintaining fairly steady levels until the end of 1926, when both dropped off again sharply. The two series, compared directly, show a correlation of + .81, but it is quite apparent that the ratio curve tends generally to precede the employment index by one or more months.

A further indication of the close relation between labor conditions and the employment index can be seen in Chart XI, which shows the trend of employment in Philadelphia compared with an index of lines of "male help wanted" advertising in Philadelphia newspapers.* The corresponding trends of the two series, showing the sharp drop in the latter part of 1923, the subsequent recovery through 1925 and 1926 and the substantially lower levels in 1927, are quite apparent.

Changes in the volume of employment naturally are accompanied by an increasing rate of labor turnover, although the latter may also be high at other periods as well. In a period of great industrial activity and acute labor shortage, such as existed in 1920 and 1923, the voluntary turnover of labor is high because workers can afford to quit their jobs and find other work elsewhere. The contrary would be true in the case of involuntary turnover which results from the laying off of labor by employers in times of dull business. For several years the Department of Industrial Research of the University of Pennsylvania has been analyzing data on labor turnover from a large number of metal plants in Philadelphia. These data, expressed as index numbers, are shown in Chart XII in comparison with the employment index for that city. The high rate of lay-offs in the spring of 1924 partially reflects the sharp decline in employment which was taking place at that time. During the following prosperous

are placed in the manual trades other than anthracite mining and railroading. Since the employment office figures show pronounced seasonal peaks in the spring and fall, the ratio index has been adjusted for seasonal variation. Owing to the great difference in amplitude of the two series the comparison is shown in terms of standard deviations.

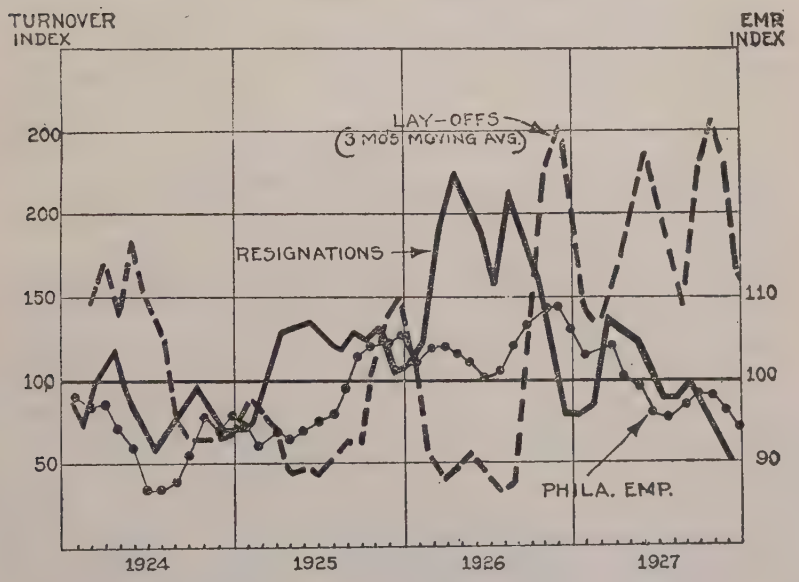
*This index was based upon data furnished by the Department of Industrial Research, University of Pennsylvania.

year and most of 1926, resignations were higher than lay-offs, but in the fall of 1926 and throughout 1927 the relative positions of the curves were again reversed, reflecting the steady decline in employment and the growing surplus of labor.

There seems little doubt that the continued decrease in the employment level during 1927 resulted, by the end of that year, in the emergence of a more serious unemployment situation than

CHART XII

Comparison of Employment Fluctuations with Labor Turnover in Philadelphia Metal Plants



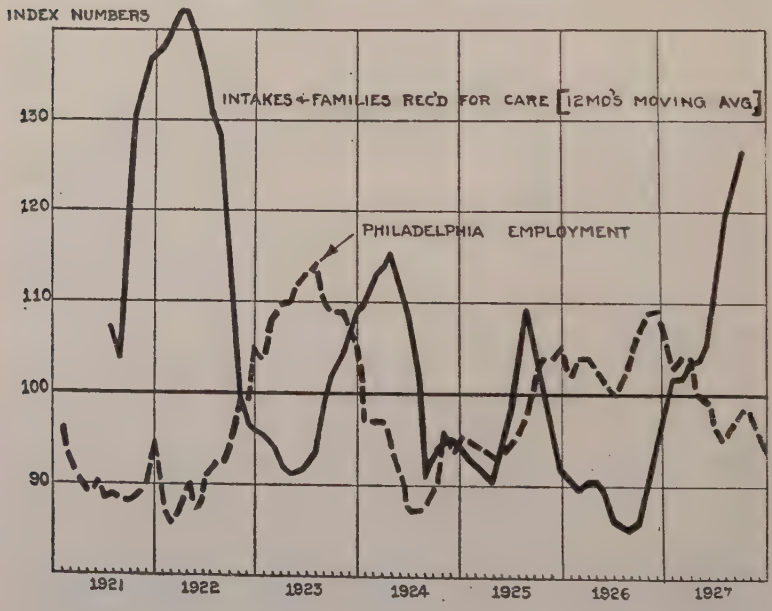
had existed at any other time since 1922. The weighted index of total employment for the state declined from 104 in November, 1926, to 95 by December of the year following, or more than eight per cent, while the wage payment index declined nearly 16 per cent in the same period. If this index adequately reflects the situation throughout the occupations which it comprises, more than 150,000 workers had been released by the end of 1927. And

if similar conditions prevailed in the trades and industries not included in the index, this total would exceed 200,000. The sharp falling off in payrolls indicates that many of those actually employed in the latter part of 1927 were working on part time and receiving smaller incomes.

Some indication of the gravity of the unemployment situation in the latter part of 1927 can be gained from examination of Chart XIII, which shows employment fluctuations in Philadelphia compared with an index of the number of applications for relief made to two important charitable societies in that city. Although the latter series is naturally subject to violent seasonal increases in the winter, its general relation to the employment situation is evident. In 1923, when employment was at the highest level in the seven-year period, demands for relief were at low ebb.

CHART XIII

COMPARISON OF EMPLOYMENT FLUCTUATIONS WITH APPLICANTS FOR RELIEF AT CHARITABLE ASSOCIATIONS



While in the winter of 1927, when unemployment was in larger volume than at any time since 1924, relief cases also reached a peak which was exceeded only in the spring of 1922.

Employment fluctuations and purchasing power

The amount of unemployment and "under-employment" existing at any time naturally affects the total income and purchasing power of the community, and should therefore be related to sales of retail goods. The great bulk of retail purchases, however, consists of foodstuffs and other necessities which, it has been noted, are bought in fairly steady quantities in times of prosperity and depression. Indeed the total volume of retail trade, except for seasonal variations, fluctuates to a much smaller degree than do industrial operations and the volume of general business.

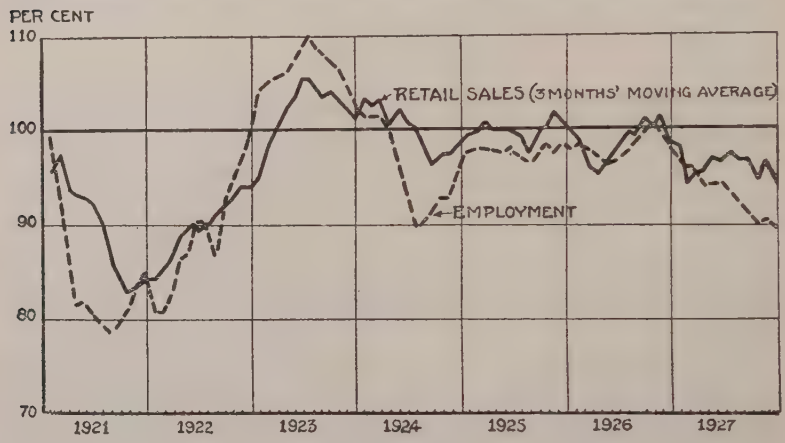
For several years the various Federal reserve banks have been collecting monthly data on volume of sales from a large number of retail department, dry goods, apparel, shoe, and furniture stores: establishments which deal chiefly in the less necessitous goods, the buying of which should be more sensitive to changes in purchasing power. A comparison of the sales of these stores in Pennsylvania with the employment index is shown in Chart XIV.

Apparently there is a fairly close relationship in the direction of movement of these two seasonally adjusted series, although the extent of fluctuation in the employment curve is much greater than that of retail sales. A careful inspection of the chart shows, however, that in many instances the turning point of the employment curve seems to precede that of retail sales by two or three months. In order to test the truth of this relationship the two series were compared by allowing a "lag" of one, two, and three months in retail sales. That is, the series were charted first so that the employment index for each month was compared with the sales index for the month immediately following, *i. e.*, the January employment index with the February sales index, February with March, etc. Similar comparisons were made allowing a lag of two months, and of three months to the retail sales index.

The coefficient of correlation, expressing the extent of relationship between the two series was + .856, when they were compared directly. When a lag of one month was given to the retail series the correlation was + .892, with a two months' lag, the coefficient rose to + .902, and with a three months' lag its value was + .904. Although no valid and final conclusions can be reached without a much more detailed investigation, it seems reasonable, on the basis of this evidence, to suppose that there is

CHART XIV

Comparison of Retail Sales with Employment in Pennsylvania



a fairly close relationship between retail sales and employment and that changes in the latter series slightly precede changes in trade volume. If this relationship were found to be generally true, it would seem to indicate that the initial impulse to cyclical changes comes not from the ultimate consumer but further back in productive channels. The steady volume of retail sales indicates that the consumer is the steadiest and most faithful buyer; the so-called "buyers' strike" originates not with him, but with the buyers of raw materials, semi-finished goods, and equipment.

Displacement of labor by machinery

A curious feature of the 1927 decline in employment is that it was not preceded by any of the characteristics of a boom period, such as the tight labor market, rising prices and stiffening money rates, which occurred just prior to the down-turn in 1923. On the contrary, in 1927 the employment level receded gradually but persistently from the rather moderate levels of 1926, in the face of ample credit supply, easy money rates, and a price level which was actually rising. Moreover, although factory employment in the United States in every month of 1927 was less than in the corresponding months of the previous year and averaged more than four per cent under the 1926 level, the output of manufactured goods was larger in several months of 1927 than in 1926, and for the year as a whole was less than two per cent. below the 1926 level.

Although no similar data are available for Pennsylvania, there is no reason to believe that much the same situation did not exist in this state. This would seem to indicate that more goods are being produced by fewer employes, *i. e.,* that the output per worker has increased appreciably even in so short a period as one year. Over a longer period of time this rapid replacement of factory labor by machinery becomes quite evident. The output of manufactured goods in the "boom" year of 1923 was nearly five per cent less than in 1926, while the number of wage earners employed in manufacturing industries actually decreased during that period by nearly 12 per cent.* There seems to be little doubt, therefore, that the falling off in employment in 1927 partially represents the permanent displacement of workers by machinery in many industries. Other factors responsible for this increase in workers' output include the installation of incentive wage systems and general improvement in the efficiency of management. The severity of the decline has of course been accentuated by the general industrial recession, and subsequent business improvement

* "The Bureau of Labor Statistics of the Department of Labor has lately studied 11 typical industries and has found that since 1914 their average production has been increased 68 per cent."—"Productivity of Labor and Industry," by James J. Davis, Secretary of Labor, *Monthly Labor Review,* Sept., 1927.

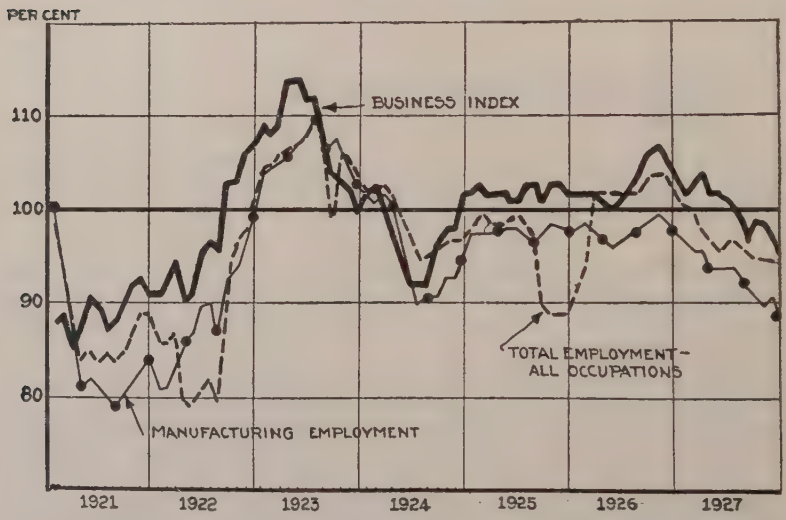
will undoubtedly result in the reemployment of many workers who have been released.

Employment fluctuations and industrial conditions

The cyclical character of the 1927 employment decline is illustrated in Chart XV, which compares the fluctuations of employment since 1921 with a business index for the state of Pennsylvania. The latter series represents the combination of a number of statistical series, including bank debits, electric power produc-

CHART XV

COMPARISON OF EMPLOYMENT FLUCTUATIONS WITH A BUSINESS INDEX FOR PENNSYLVANIA



tion, freight car loadings, and output of the more important commodities produced in Pennsylvania.* It is quite apparent that the employment curve has moved in close accordance with this business index, although there has been a slightly increasing spread

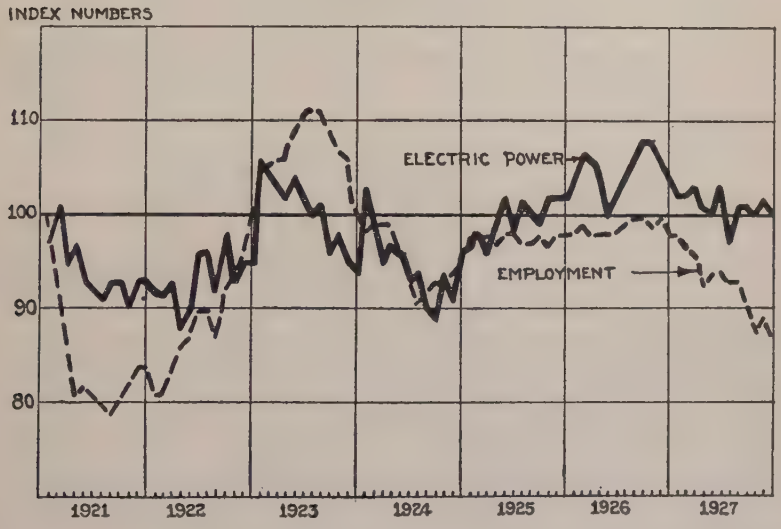
* This index has been prepared for its own confidential use by a large corporation operating in Pennsylvania, and is believed to be an excellent measure of changes in the volume of Pennsylvania business transactions. Although the data for this index have been courteously loaned for use here, the company desires that its own identity be not revealed.

between the two in recent years which may reflect the increased productivity of labor resulting from the displacement of labor by power-driven machinery.

The comparison of electric power production in Pennsylvania with employment in factory industries may be of some interest in this connection. Central station output of electricity has grown at an extremely rapid rate during recent years, reflecting not alone

CHART XVI

Comparison of Electric Power Production with Employment in Pennsylvania



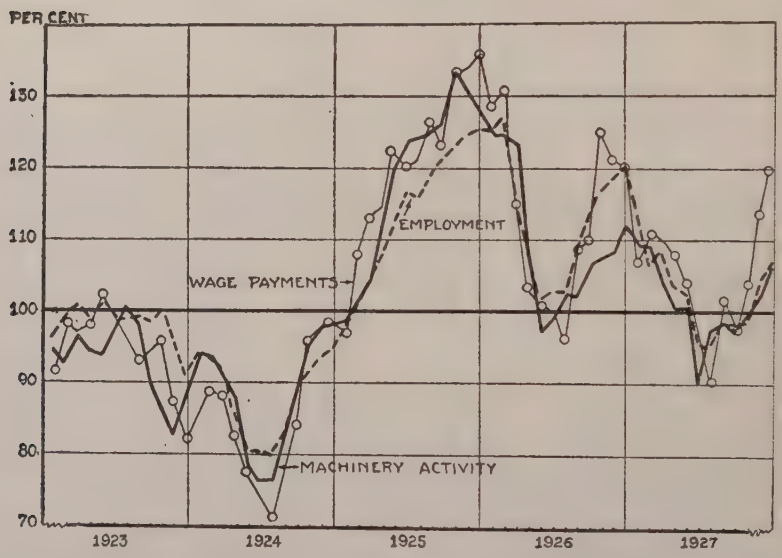
the replacement of hand by machine processes, but chiefly the displacement of factory-owned power plants by purchased power and the increased use of electricity for lighting and other purposes. Hence, the electric power figures were adjusted by the elimination of this long-time growth factor as well as the typical seasonal variations, so as to make them comparable with the employment index. The power index is, therefore, shown on the chart as if it had a horizontal rather than a steep upward trend.

The two series show only a general similarity in their cyclical movements and considerable discrepancy in their minor variations. The slight downward trend in employment since 1923 is quite apparent, however, while the power curve has remained close to or above the base line, which itself represents a steep upward trend.

The increasing productivity of labor has evidently been more pronounced in some industries than in others. In Chart XVII a

CHART XVII

COMPARISON OF EMPLOYMENT, WAGE PAYMENTS, AND MACHINERY ACTIVITY IN THE SILK INDUSTRY

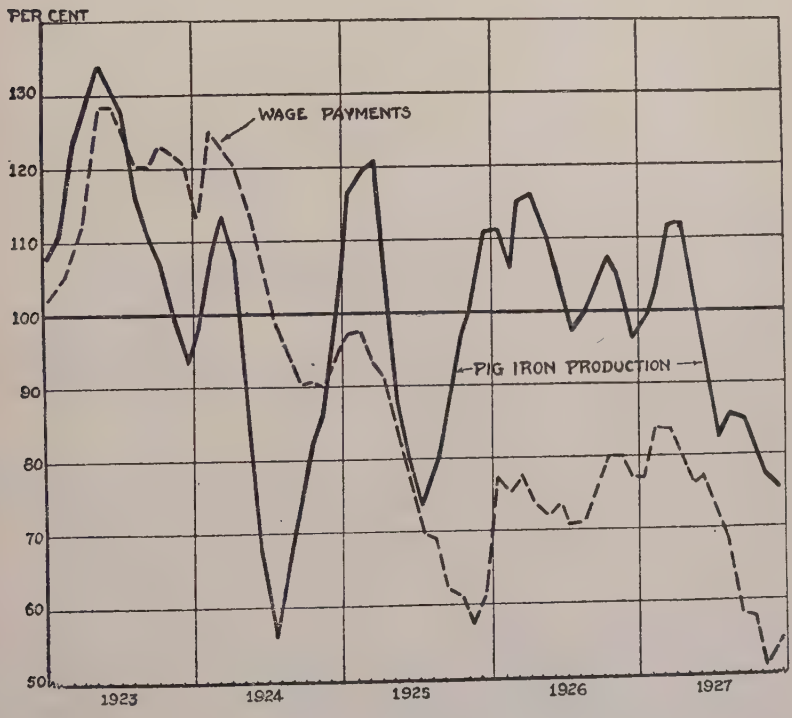


comparison has been made of the employment and payroll indexes with a weighted index of silk machinery activity in Pennsylvania. The latter index is based upon reports from practically the entire industry to the Silk Association of America, while the two former series are, of course, based upon only a fraction of the industry. The close correspondence among the three indexes during the

entire period, which, incidentally, shows how accurately the employment and wage payment indexes measure productive activity in this industry, clearly demonstrates that there has been little or no displacement of labor by machinery in this industry during recent years.

CHART XVIII

COMPARISON OF WAGE PAYMENTS IN BLAST FURNACE INDUSTRY WITH PIG IRON PRODUCTION



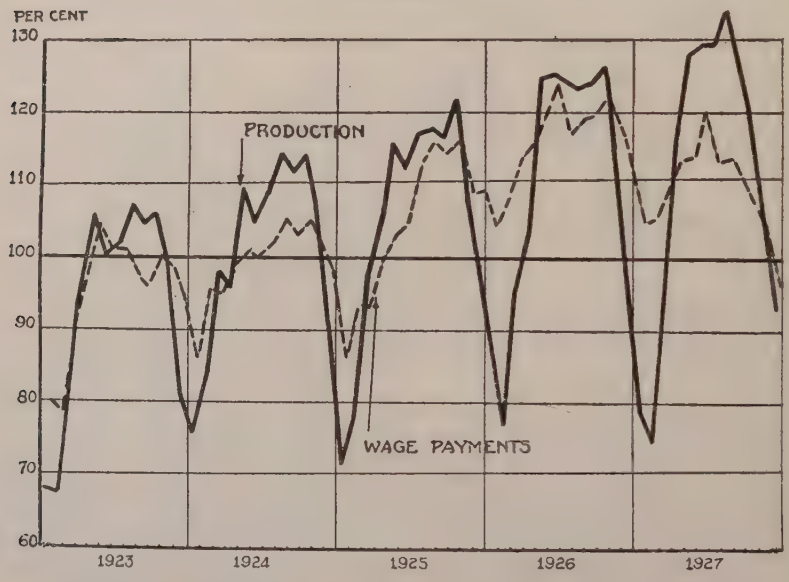
A striking contrast to the situation in the silk industry is indicated by Chart XVIII, which shows the wage payment indexes for the blast furnace industry compared with pig iron production in Pennsylvania. Since 1923, when both wage payments and production were at very high levels, the latter has declined 43 per

cent, while payrolls at the end of 1927 were more than 57 per cent smaller. The relatively greater decline in payrolls does not reflect lower wages, since employment has decreased to a like extent, but appears to indicate greatly increased output per worker.

Somewhat similar evidence seems to be presented in Chart XIX, comparing production of cement with the wage payment

CHART XIX

COMPARISON OF WAGE PAYMENTS AND PRODUCTION IN THE CEMENT INDUSTRY



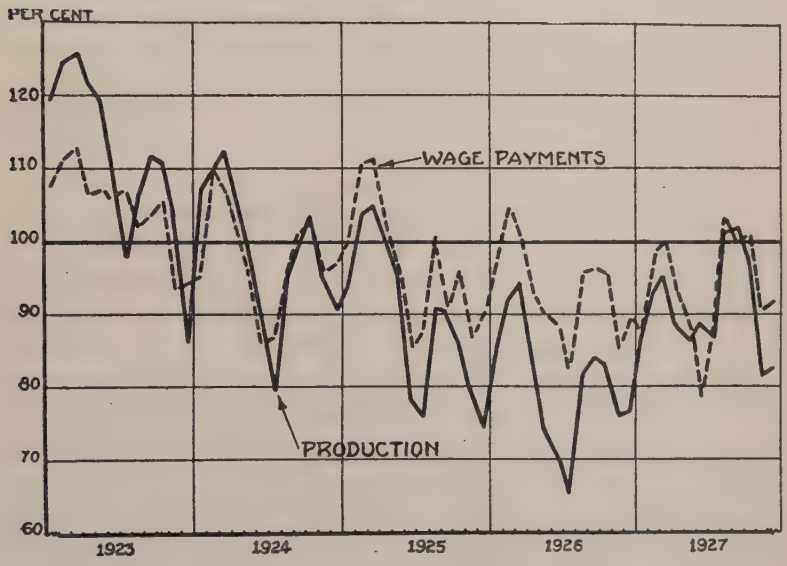
index for that industry, although here the divergence between the trends of the two series is not apparent except in 1927, when employment declined noticeably despite increased output. This chart shows that although payrolls and production both display marked seasonality the seasonal "swing" in the former is much less than in the latter. In the dull season of January and Febru-

ary many of the workers are engaged in overhauling and repairing equipment which is idle at that time. Hence, output at that period declines to relatively lower levels than do employment and payrolls.

Chart XX shows a fairly close correspondence between payrolls of reporting shoe factories and monthly output of shoes of the entire industry in Pennsylvania. As in the case of the cement

CHART XX

COMPARISON OF WAGE PAYMENTS AND PRODUCTION IN THE SHOE INDUSTRY



industry, however, wage payments experience a smaller seasonal variation than production, while in 1926, there is a considerable disparity between the two series. There is little evidence, however, of a marked displacement of labor by machinery in recent years, as the relative position of the two curves is much the same in 1927 as in 1923.

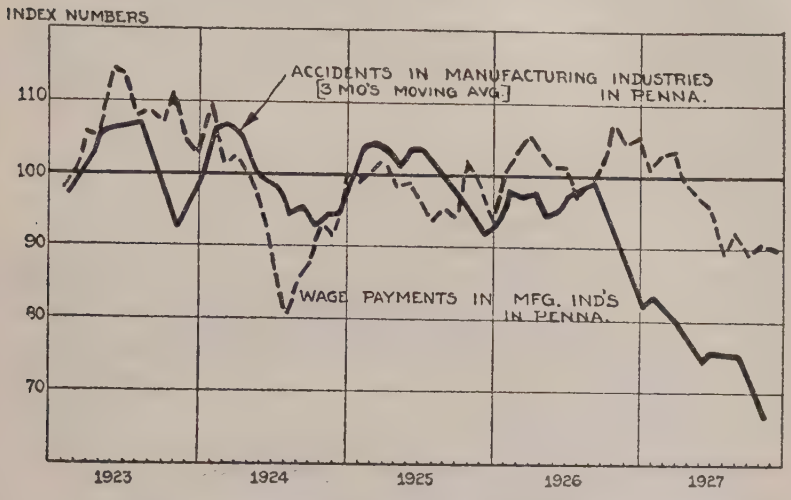
Unfortunately, production figures are not available for many industries in the state, hence more extensive comparisons cannot

be made. But it is quite patent that the employment and payroll indexes must be used circumspectly in attempting to estimate actual output in particular industries. Two possible sources of error appear: one deriving from the fact that during the dull seasons of the year and in inventory periods many of the workers are engaged in repair work and in the alteration and installation of equipment. Another source of error lies in the fact that over long periods of time, and particularly in recent years, employment and wage levels show a gradual "spread" from production levels, owing to the displacement of hand labor by machinery. The general index of wage payments for all manufacturing industries combined undoubtedly furnishes a much more dependable measure of changes from month to month in productive activity, for the seasonal discrepancies which appear in individual industries are smoothed out to a great extent, and the total index shows only small variations between seasons. The wage payment indexes, based upon total weekly amounts paid to the working force, reflect over-time work in periods of activity and part-time employment in dull seasons, and therefore constitute a more accurate measure of the rate of operations than do the employment indexes.

For the same reason the payroll indexes possess some usefulness to the Department of Labor and Industry in the interpretation of accident rates in various industries. Accident rates may increase or decrease from month to month on account of increased or decreased hazards in industry, or because of changes in "employe-hour exposure" to accidents. The general relationship between these two series is shown in Chart XXI, in which an index of the number of accidents in manufacturing industries reported to the Department each month is compared with the factory wage payment index. As there is some delay in reporting accident figures there is no correspondence in the minor variations of the two series, although the general trends are quite similar. Of considerable interest is the great reduction in accident rates during 1927, a decline which far exceeded the lessened exposure reflected by the fall in wage payments. This improvement is probably partly attributable to better accident prevention work,

CHART XXI

COMPARISON OF WAGE PAYMENTS AND ACCIDENTS IN PENNSYLVANIA FACTORIES

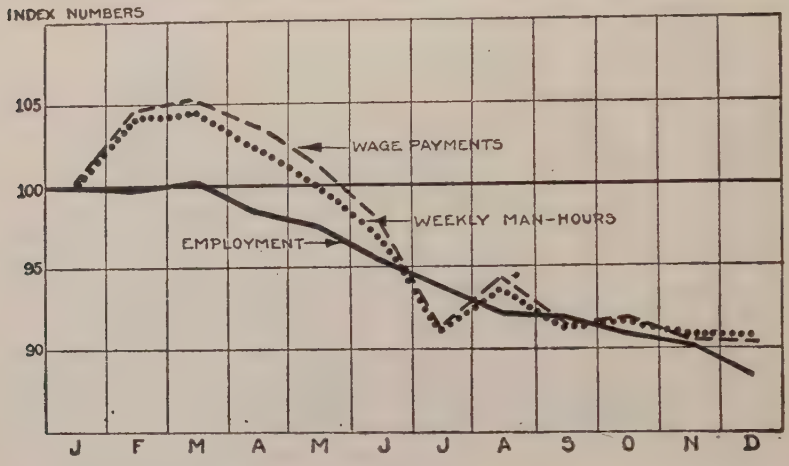


but it is also likely that many of the inexperienced and unskilled workers, who are more subject to accidents, were laid off in 1927, when industrial operations slackened considerably.

Obviously, a monetary measure, such as wage payments, can never provide an entirely satisfactory basis for estimating either operations or employe-hour exposure to accidents since such an index reflects changes in wage rates as well as changes in working time. For the past several years, however, changes in wage rates have been so small as to introduce no appreciable bias into these figures. In January, 1927, the collection of data on employe-hours from some 400 of the reporting plants was commenced, in an effort to obtain a more accurate measure of under- and over-employment. The changes in the total employe-hours and weekly wage payments of this identical group of plants during 1927 are shown in Chart XXII, the figures for each month being expressed as percentages of the January total. The very close correspondence between wage payments and employe-hours indicates that even in this year of business decline and "easy" labor conditions

CHART XXII

COMPARISON OF EMPLOYMENT, WAGE PAYMENTS, AND MAN-HOURS IN 1927



wage rates were not generally reduced. For this period, at any rate, the wage payment index closely measured the actual hourly employment of labor.

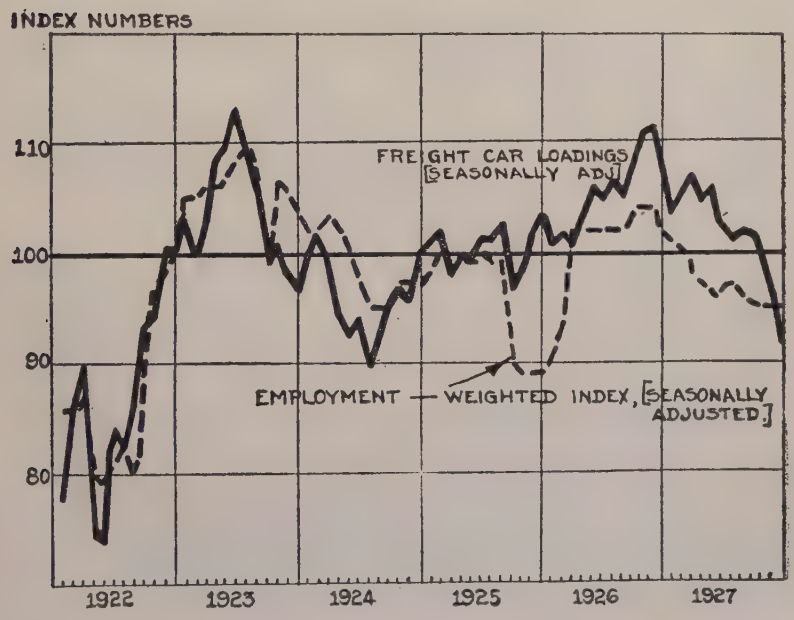
Employment fluctuations and financial conditions

The responsibility of the Federal Reserve Bank for the proper adjustment of the supply of credit to the needs of commerce and industry makes it essential for the Bank to be continuously informed of the changes in industrial and commercial activity which will affect the use of bank credit. Such information is difficult to obtain in adequate detail and with sufficient promptness to be of value, but it is still more difficult to interpret and translate the mass of statistical data currently available into a clear record of the complex interplay of economic factors which affect the demand for credit. In the discharge of its responsibility the Bank has found the employment and wage data of considerable value as an indicator of the rate of industrial operations and of the volume of purchasing power in the state.

There is of course a close relationship between industrial activity and banking operations, not only directly, but through the influence of the former on purchasing power and the volume of distribution. The close relation of employment to retail distribution has been pointed out. There appears also to be a general correspondence between employment and railroad freight movement, as shown in Chart XXIII. Freight car loadings are not available for Pennsylvania alone; the Allegheny district includes parts of this state and of several others as well. This series is, therefore, not strictly comparable with employment; moreover, it is subject to rather erratic fluctuations. The general trends of the two series are similar, however; both employment and car loadings rose to high levels in 1923 and in 1926, while the influence of the anthracite strikes in 1922 and in 1925 is seen in both curves.

CHART XXIII

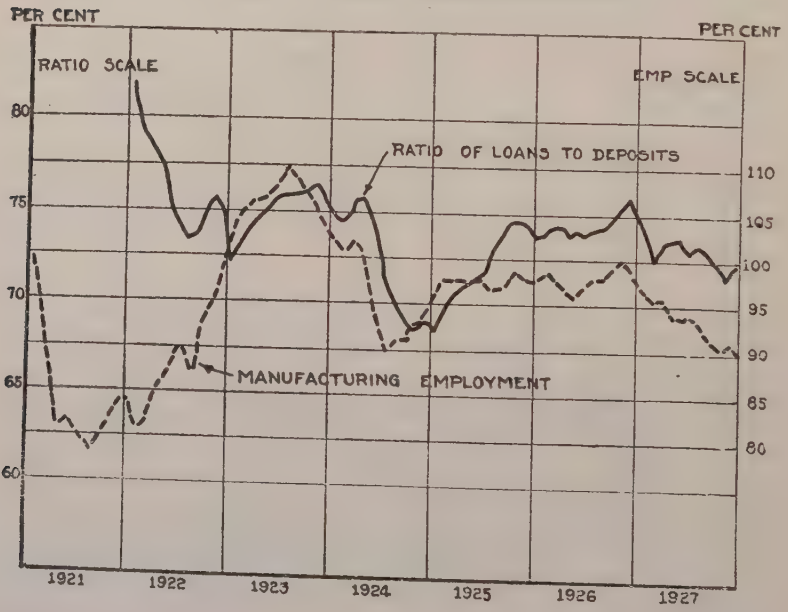
COMPARISON OF FREIGHT CAR LOADINGS IN ALLEGHENY DISTRICT WITH EMPLOYMENT IN PENNSYLVANIA



In Chart XXIV, a comparison is made of employment in Pennsylvania with the ratio of loans to deposits of member banks in the Philadelphia and Cleveland Federal reserve districts. This ratio, which in a sense expresses the intensity of demand for credit, is naturally high when industry is active and using large amounts of credit, while it declines when business recedes and loans are paid off. Since 1923 the two series have a quite similar general character, with the ratio curve showing a decided lag of

CHART XXIV

COMPARISON OF EMPLOYMENT FLUCTUATIONS IN PENNSYLVANIA WITH RATIO OF LOANS TO DEPOSITS OF MEMBER BANKS IN PHILADELPHIA AND CLEVELAND FEDERAL RESERVE DISTRICTS



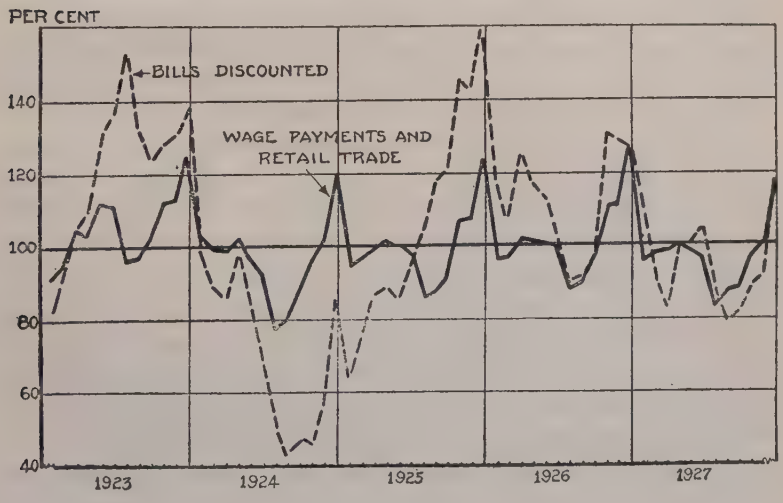
two or three months after the employment curve. This evidently reflects the fact that when the volume of orders commences to shrink, manufacturers curtail their operations and release workers immediately, but are unable to liquidate their notes at the banks

until some time later when their own outstanding accounts have been settled. In the same way, when operations are resumed after a dull period, employers are able for a time to finance their operations with their own funds. The wide divergence between the two curves in 1921 and the high ratio of loans to deposits in that year is evidence of the large amount of "frozen" loans which were carried by the banks after the business collapse in 1920.

The Federal Reserve Bank stands in the same relation to the member banks in this district as the latter do to their own customers. When in need of funds the member bank can borrow from the Federal Reserve Bank by rediscounting the notes which the former holds against loans to its customers. During the period from 1923 to 1927 credit was in ample supply, and the member banks did not borrow excessively from the Reserve Bank; therefore, the volume of bills discounted held by the latter

CHART XXV

COMPARISON OF COMBINED INDEX OF WAGE PAYMENTS AND RETAIL SALES IN PENNSYLVANIA WITH BILLS DISCOUNTED FOR MEMBER BANKS BY FEDERAL RESERVE BANKS OF PHILADELPHIA AND CLEVELAND



has been but a small fraction of the total outstanding bank credit. As seen in Chart XXV, the volume of bills discounted by the Federal Reserve Bank of Philadelphia has varied widely, showing pronounced seasonal and cyclical changes. The sharp rise in December of each year reflects the seasonal demand for currency at that time, while the declines in 1924 and in 1927 reflect the curtailed needs of industry for currency to be used in wage payments. The second curve on the chart is an attempt to furnish a measure of the currency needs of retail merchants and industrial employers. These two groups of business men are the principal users of currency, since retail trade is carried on largely by cash payments, and industrial wage earners are paid chiefly with money instead of checks. The two series show quite similar seasonal characteristics, although discounts have fluctuated much more widely than wage payments and retail sales. During the greater part of 1926 and throughout 1927, however, the movement of the two series showed close correspondence.

The index numbers presented in this study furnish an accurate and reliable measure, not hitherto available, of the trend of employment and payrolls in Pennsylvania, a state which owing to the great diversity and size of its industries, constitutes a good industrial cross-section of the United States. Such measures of changes in the employment of productive workers and in wage earners' incomes provide a valuable aid in the analysis of social and economic conditions generally. Labor is the keystone of the economic arch, providing on the one hand the human effort required to produce and distribute goods, and on the other, the buying power necessary to purchase and consume these goods. The prosperity of business, therefore, depends inevitably upon the prosperity of the workers. A comparison of the employment index for Pennsylvania with a business index for the state and with other indicators of business and financial conditions such as freight car loadings, power production, the ratio of bank loans to deposits, rediscounts of commercial banks, and retail sales

volume reveals the striking interdependence among the various phases of economic activity. Particularly impressive is the close correspondence between the trends of employment and retail sales, a rise or fall in the former being followed within two or three months by a corresponding change in the volume of sales.

Comparisons of productive activity in the various industries of the state with fluctuations in employment and payrolls in the same industries afford significant indications of changing employment conditions in the last few years. In some industries, such as silk manufacture, there has been a continuous and close correspondence between factory operations and employment volume. In many other industries, particularly the metal trades, an increasing spread has occurred between employment and production, indicating that more goods are being produced by fewer workers, *i. e.,* increasing per capita output. These divergent trends between production and employment reflect the widespread and striking improvement in technical methods and productive equipment which have been made in recent years. These advances in technology, though reducing production costs and increasing industrial efficiency, have brought with them unemployment problems resulting from the displacement of labor by machinery.

The employment index, measuring changes in the number of employed workers, furnishes a valuable aid in the determination of the character and extent of unemployment, although the latter phenomenon is one which almost defies exact measurement. It is quite evident, however, from a comparison of the employment index with such measures of labor conditions as labor turnover, newspaper "help wanted" advertising, activities of public employment offices and the applications for relief made to charitable associations, that the low level of the employment index in 1921 and 1924 and, more recently, in 1927, reflected a considerable amount of unemployment, and only partially, a shift of workers from manufacturing to other occupations. The amount of newspaper advertising for workers and the number of positions available through public employment offices both fluctuated in accordance with the employment level, while the number of relief cases handled by charitable associations rose to high levels when the

index declined, reflecting the extensive unemployment existing in those periods.

Unemployment, moreover, is not confined to these periods of "cyclical" depression. Even in years of prosperity a considerable amount of seasonal unemployment exists, as evidenced by the fluctuations recurring regularly each year in retail trade, in the building industry, and quite noticeably in over half of the manufacturing industries included in the index. Unemployment of labor, whether it be seasonal or cyclical, or of that transitory type resulting from the voluntary or involuntary shift of workers from one industry to another or from one plant to another, is an economic and social burden which, in the last analysis, rests not only upon the worker but upon the employer and the entire community. Unemployed labor usually connotes unemployed capital; in either case, unused capacity, an overhead charge upon the community which results in reduced output, higher costs and weakened labor morale.

These problems, arising from the instability of our economic system, cannot be solved by arbitrary dictum or by official action; their solution must await a better understanding of the complex relationship and interdependence of the various phases of industrial and commercial activity. Study of these perplexing problems is one which offers impelling possibilities both for the economist and the statistician. For the former it may help to reveal the causal relationships between the productive and distributive forces which are responsible for economic change, while the latter may find in the study of the relationship of individual statistical series for particular industries and particular regions a means of forecasting changes in business conditions.

Such analyses are of course impossible without effective tools —reliable and accurate quantitative measures of economic conditions. It has been the purpose of this study to provide, in a measure, such statistical tools for determining the course of employment and wages in Pennsylvania. It is hoped that the data here brought together, when supplemented by other information, will furnish a dependable measure of economic conditions, and so contribute to a further understanding of the complex and ever-changing forces of commercial and industrial life.

APPENDIX

Monthly Index Numbers of Employment and Wage Payments in Pennsylvania 1921 to 1927

Base Period for all Index Numbers is Monthly Average for 1923 to 1925

EMPLOYMENT INDEX NUMBERS

Industries	PAGE
All occupations	117
Anthracite	118
Automobiles	137
Automobile bodies and parts	138
Blast furnaces	131
Brass and bronze products	137
Bread and bakery products	144
Brick, tile and pottery	147
Carpets and rugs	141, 142
Cement	148
Chemicals and drugs	151
Chemical products group	126
Cigars and tobacco	147
Coke	151
Cotton goods	139
Confectionery	145
Construction	119
Consumers' goods group	128, 129
Electrical apparatus	135
Engines and pumps	136
Explosives	152
Foods and tobacco group	123, 124
Foundries	134
Furniture	150
Glass	148
Hardware and tools	136
Hats	142
Hosiery	142
Ice cream	145
Iron and steel forgings	132
Knit goods, other	143
Leather and rubber products group	127
Leather products, other	154
Leather tanning	153
Locomotives and cars	138
Lumber and planing mills	149
Lumber products group	125, 126
Machinery and parts	135

PAGE

Manufacturing 117, 118
Meat packing 146
Men's clothing 143
Metal products group 121
Paints and varnishes 152
Paper and printing group 128
Paper and wood pulp 154
Paper boxes and bags 155
Petroleum refining 152
Printing and publishing 155
Producers' goods group 129, 130
Railroad repair shops 138
Retail trade 120
Rubber tires and goods 154
Shipbuilding 139
Shirts and furnishings 144
Shoes 153
Silk goods 140
Steam and hot water heating apparatus 133
Steel works and rolling mills 131
Stone, clay and glass products group 124, 125
Stoves and furnaces 133, 134
Structural iron work 132, 133
Textile dyeing and finishing 141
Textile products group 122, 123
Transportation and communication 119
Transportation equipment group 122
Wholesale trade 120
Wooden boxes 150
Woolens and worsteds 140
Women's clothing 143

All Occupations

	1921	1922	1923	1924	1925	1926	1927
January	95.1	85.9	105.8	101.3	97.9	84.6	99.9
February	92.5	86.5	107.3	102.3	101.0	89.7	99.4
March	87.9	88.0	108.4	103.1	100.6	100.3	98.6
April	82.6	75.9	107.8	101.9	99.7	100.6	96.7
May	83.3	73.3	109.0	99.5	99.5	99.8	96.9
June	82.1	75.4	110.1	96.7	99.1	99.9	96.3
July	82.4	75.2	109.4	94.7	97.5	99.5	94.8
August	82.1	73.7	108.1	94.8	97.3	99.9	94.5
September	84.0	88.4	96.1	96.1	85.6	101.3	94.1
October	86.5	97.3	108.0	97.1	85.0	102.3	93.9
November	88.0	98.5	107.5	98.0	85.1	102.5	93.7
December	88.9	101.7	104.5	97.8	86.3	101.6	93.4
Average	86.3	85.0	106.8	98.6	94.6	98.5	96.0

All Occupations

(Weighted index of seasonally adjusted series)

	1921	1922	1923	1924	1925	1926	1927
January	98	86	105	102	98	91	101
February	94	86	105	102	100	94	100
March	89	87	106	103	99	102	98
April	84	80	106	102	99	102	97
May	85	79	107	100	99	102	96
June	84	81	108	97	100	102	97
July	85	82	110	95	99	102	97
August	84	80	108	95	99	102	96
September	85	91	99	96	90	104	95
October	87	97	107	97	89	104	95
November	89	98	106	97	89	104	95
December	89	101	104	97	89	102	95

Manufacturing

	1921	1922	1923	1924	1925	1926	1927
January	99.6	80.8	104.3	98.3	97.9	98.3	97.6
February	95.3	81.6	106.4	100.0	99.4	100.1	97.6
March	89.0	84.2	108.0	100.7	99.6	99.7	97.4
April	82.1	87.2	107.2	99.6	98.4	99.1	94.3
May	82.0	87.1	108.5	95.9	97.7	97.6	93.8
June	79.7	89.5	109.9	92.2	97.3	97.2	92.9
July	77.9	88.3	108.9	89.1	95.3	97.0	91.4
August	77.1	85.3	108.4	90.2	95.3	97.8	90.9
September	79.2	91.2	107.7	91.6	96.6	99.4	90.1
October	82.3	95.2	107.8	93.6	98.3	100.4	89.2
November	83.8	96.1	106.2	93.8	98.0	100.2	89.2
December	84.7	100.4	101.6	96.2	99.3	98.7	87.8
Average	84.4	88.9	107.1	95.1	97.8	98.8	92.7

MANUFACTURING
(Adjusted for seasonal variation)

	1921	1922	1923	1924	1925	1926	1927
January	100	81	104	98	98	98	98
February	94	81	105	99	98	99	97
March	87	83	106	99	98	98	96
April	81	86	106	99	97	98	93
May	82	87	109	96	98	98	94
June	81	90	111	93	98	98	94
July	80	90	111	91	97	99	93
August	79	87	111	92	97	100	93
September	80	92	109	93	98	100	91
October	82	94	107	93	97	99	88
November	84	96	106	94	98	100	89
December	84	99	101	95	98	98	87

MANUFACTURING
(Weighted index of seasonally adjusted series)

	1923	1924	1925	1926	1927
January	104	102	98	98	97
February	105	101	98	99	96
March	106	102	98	98	96
April	106	101	98	97	94
May	107	97	98	96	94
June	108	93	98	97	94
July	110	90	97	98	94
August	109	91	97	98	92
September	108	91	97	99	91
October	107	93	99	100	90
November	105	93	98	100	91
December	103	95	98	98	89

ANTHRACITE

	1921	1922	1923	1924	1925	1926	1927
January	104.5	113.5	115.1	116.8	100.7	8.1	119.6
February	106.8	114.2	115.3	116.5	115.4	36.7	119.2
March	106.2	111.6	114.8	116.0	112.2	111.4	114.3
April	105.4	25.1	113.2	114.4	111.4	114.6	115.5
May	108.7	7.6	114.6	115.3	114.3	115.8	119.0
June	109.6	8.3	113.6	114.4	114.3	116.9	118.7
July	110.5	8.6	112.6	115.8	114.5	116.9	116.9
August	110.8	9.2	112.3	114.0	114.9	117.8	117.1
September	112.8	74.2	31.5	115.7	23.5	118.0	118.7
October	113.3	109.9	113.3	112.4	8.6	118.9	119.8
November	112.9	110.9	114.1	115.6	8.3	119.3	116.6
December	115.2	112.8	116.0	100.7	8.0	119.9	119.7
Average	109.7	67.2	107.2	114.0	78.8	101.2	117.9

TRANSPORTATION AND COMMUNICATION

	1921	1922	1923	1924	1925	1926	1927
January	79.1	89.3	99.6	101.5	97.0	95.0	96.1
February	78.9	88.2	100.3	101.5	97.2	96.0	95.1
March	78.9	88.6	100.8	101.9	97.2	97.3	94.9
April	78.5	88.4	102.4	101.1	96.8	97.5	94.3
May	78.5	88.8	103.6	100.6	96.6	96.9	94.1
June	79.9	90.8	105.0	100.1	96.5	98.0	94.4
July	88.4	92.6	106.5	100.0	96.2	98.0	93.1
August	88.5	93.7	107.1	98.7	95.6	97.0	92.8
September	88.8	95.6	105.5	98.4	94.6	96.9	92.0
October	90.1	97.1	106.6	98.4	95.0	98.1	92.2
November	92.4	98.6	106.5	98.3	96.1	98.2	91.8
December	91.6	99.3	103.9	97.3	95.8	97.9	91.3
Average	84.5	92.6	104.0	99.8	96.2	97.2	93.5

CONSTRUCTION

	1926	1927
January	89.6	91.9
February	80.7	81.3
March	107.4	73.4
April	122.0	89.5
May	143.2	92.8
June	144.2	103.4
July	144.2	108.4
August	140.3	108.8
September	161.4	107.0
October	150.6	108.3
November	135.2	110.3
December	106.2	92.5
Average	127.1	97.3

CONSTRUCTION
(Adjusted for seasonal variation)

	1926	1927
January	111	114
February	112	113
March	133	91
April	130	95
May	136	88
June	131	94
July	128	96
August	126	98
September	135	89
October	131	94
November	124	101
December	119	104

Wholesale Trade

	1923	1924	1925	1926	1927
January	----------	99.7	100.6	99.5	100.0
February	----------	99.8	100.3	99.0	99.3
March	----------	99.9	100.1	99.4	99.1
April	----------	99.4	100.3	99.2	99.3
May	----------	99.3	99.8	99.1	98.9
June	----------	99.2	99.8	99.3	99.0
July	----------	99.2	99.8	98.7	98.7
August	100.8	99.4	99.4	98.7	98.6
September	101.4	99.9	99.5	99.3	98.4
October	100.3	99.9	100.2	99.6	98.8
November	99.9	100.1	100.4	100.5	98.6
December	99.8	100.6	99.7	100.7	98.9
Average	100.4	99.7	100.0	99.4	99.0

Retail Trade

	1923	1924	1925	1926	1927
January	----------	92.4	100.4	100.7	103.3
February	----------	92.9	98.2	98.0	99.1
March	----------	103.8	97.9	100.0	101.7
April	----------	101.2	100.6	100.3	100.1
May	----------	100.0	98.5	99.8	98.5
June	----------	99.9	97.3	99.9	97.0
July	----------	93.4	93.3	95.7	95.3
August	89.6	91.8	92.0	93.3	94.1
September	93.7	98.2	94.8	97.8	96.6
October	96.5	102.3	100.0	100.9	100.4
November	105.2	109.6	106.2	111.1	109.2
December	113.6	120.6	117.9	118.4	117.1
Average	99.7	100.5	99.8	101.3	101.0

Retail Trade
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	----------	92	100	101	103
February	----------	96	101	101	102
March	----------	104	98	100	102
April	----------	101	101	100	100
May	----------	101	100	101	100
June	----------	102	99	102	99
July	----------	99	99	102	101
August	97	100	100	101	102
September	98	102	99	102	101
October	98	103	101	102	101
November	97	102	98	103	101
December	97	103	101	101	100

METAL PRODUCTS GROUP

	1921	1922	1923	1924	1925	1926	1927
January	96.2	67.8	105.0	104.3	98.8	93.0	93.1
February	88.8	69.1	106.0	107.1	100.2	96.0	93.3
March	80.6	74.1	108.4	107.5	98.7	96.1	92.8
April	67.1	78.3	108.0	106.7	97.3	96.1	91.1
May	69.2	79.6	108.9	100.5	95.0	94.3	89.7
June	65.0	82.5	109.8	94.0	92.9	93.9	89.4
July	61.9	82.3	107.1	88.1	90.3	93.6	87.5
August	62.0	78.5	108.3	89.3	89.9	95.4	85.9
September	66.0	86.0	110.6	90.4	91.8	97.6	85.8
October	70.4	92.2	109.8	91.8	93.8	98.2	83.3
November	72.5	92.9	107.8	91.6	93.3	97.5	82.8
December	73.9	98.9	106.0	95.7	95.4	93.4	81.5
Average	72.8	81.9	108.0	97.3	94.8	95.4	88.0

METAL PRODUCTS GROUP
(Adjusted for seasonal variation)

	1921	1922	1923	1924	1925	1926	1927
January	96	68	105	104	99	93	93
February	87	68	104	105	98	94	92
March	79	73	106	105	97	94	91
April	66	77	106	105	95	94	89
May	69	79	108	100	94	93	89
June	66	84	112	96	95	96	91
July	63	84	109	90	92	96	89
August	65	83	114	94	95	100	90
September	67	88	113	92	94	100	88
October	69	90	108	90	92	96	82
November	73	93	108	92	93	98	83
December	73	97	104	94	94	92	80

METAL PRODUCTS GROUP
(Weighted index of seasonally adjusted series)

	1923	1924	1925	1926	1927
January	102	107	99	93	95
February	101	107	98	94	93
March	103	107	96	94	92
April	104	107	96	95	91
May	105	102	94	94	91
June	107	96	94	95	92
July	113	91	93	97	91
August	112	91	91	97	88
September	113	91	92	99	87
October	112	92	94	100	84
November	109	92	93	100	84
December	107	95	94	94	82

TRANSPORTATION EQUIPMENT GROUP

	1921	1922	1923	1924	1925	1926	1927
January	105.7	98.5	110.2	89.9	94.0	97.0	97.6
February	103.6	95.4	114.0	91.2	95.1	98.6	97.9
March	91.3	100.5	116.0	93.4	97.1	99.2	95.9
April	98.6	104.2	114.8	93.7	95.7	100.8	92.4
May	97.0	107.1	117.7	91.1	95.7	99.2	90.2
June	99.0	111.8	121.9	89.5	95.7	97.3	88.0
July	100.7	98.1	123.1	89.8	92.6	97.1	86.4
August	97.9	98.4	121.8	89.0	91.5	97.0	84.5
September	94.8	100.7	115.4	88.3	91.5	96.3	81.2
October	100.4	104.8	114.8	90.4	92.9	96.6	79.9
November	101.1	108.9	113.2	90.6	92.4	96.3	79.9
December	99.3	106.4	100.1	92.5	94.2	97.4	79.6
Average	99.1	102.9	115.2	90.8	94.0	97.7	87.8

TRANSPORTATION EQUIPMENT GROUP
(Weighted index of seasonally adjusted series)

	1923	1924	1925	1926	1927
January	115	92	93	95	93
February	117	93	94	97	93
March	118	94	96	97	90
April	116	94	95	98	87
May	118	91	95	96	86
June	120	89	96	95	84
July	121	89	93	94	83
August	119	89	92	94	81
September	113	88	93	93	79
October	113	91	94	93	78
November	112	91	92	92	79
December	100	92	93	93	79

TEXTILE PRODUCTS GROUP

	1921	1922	1923	1924	1925	1926	1927
January	82.1	100.1	104.7	99.8	98.4	106.0	104.4
February	84.7	99.5	106.5	99.0	100.7	105.7	102.5
March	85.4	101.2	107.0	99.1	102.5	102.8	103.5
April	90.3	102.4	106.2	94.1	102.2	98.5	100.9
May	86.7	97.3	106.2	90.9	103.6	96.2	100.6
June	90.1	99.4	105.1	85.6	104.1	96.1	97.6
July	89.5	99.5	104.6	81.3	102.5	95.5	95.7
August	93.4	100.2	103.2	84.5	103.7	97.1	96.7
September	95.7	100.6	102.7	89.2	104.4	100.3	97.4
October	95.3	96.1	103.4	93.8	105.7	103.9	99.4
November	98.3	96.5	101.0	94.8	106.2	105.5	102.7
December	102.9	103.5	99.2	96.7	106.5	106.2	102.7
Average	91.2	99.7	104.2	92.4	103.4	101.2	100.3

TEXTILE PRODUCTS GROUP
(Adjusted for seasonal variation)

	1921	1922	1923	1924	1925	1926	1927
January	81	98	103	98	97	104	102
February	83	98	104	97	99	104	101
March	84	99	105	97	101	101	102
April	90	102	106	94	102	99	101
May	89	100	110	94	107	99	104
June	92	101	107	87	106	98	100
July	91	102	107	83	105	97	98
August	94	101	104	85	105	98	98
September	97	102	104	90	106	101	98
October	95	96	103	94	106	104	99
November	97	96	100	94	105	105	102
December	101	102	97	95	104	104	101

TEXTILE PRODUCTS GROUP
(Weighted index of seasonally adjusted series)

	1923	1924	1925	1926	1927
January	102	99	97	108	106
February	104	98	99	107	104
March	104	97	102	104	105
April	105	94	103	100	103
May	106	91	106	99	103
June	106	87	107	99	100
July	107	83	106	99	99
August	104	86	106	101	100
September	103	90	106	104	100
October	102	92	108	106	101
November	99	92	108	107	104
December	99	95	109	109	105

FOODS AND TOBACCO GROUP

	1921	1922	1923	1924	1925	1926	1927
January	95.8	102.4	107.2	97.1	96.5	95.8	96.4
February	99.9	108.7	109.3	100.6	97.1	96.8	97.2
March	102.1	113.8	108.3	97.5	97.2	96.3	96.6
April	94.5	106.5	104.3	96.9	93.7	94.9	84.3
May	96.4	98.1	104.6	96.8	96.1	95.7	95.7
June	93.7	103.9	103.9	97.0	98.4	95.6	98.3
July	97.1	106.2	101.0	98.3	95.5	97.3	98.8
August	96.5	112.2	98.9	97.8	97.4	97.3	98.2
September	98.5	110.8	103.1	102.2	98.5	98.3	100.0
October	103.4	109.8	104.8	102.4	101.2	100.5	100.5
November	104.2	110.0	104.4	98.5	98.7	99.4	97.4
December	106.0	108.1	99.7	97.0	97.8	99.1	91.9
Average	99.0	107.5	104.1	98.5	97.3	97.3	96.3

FOODS AND TOBACCO GROUP
(Adjusted for seasonal variation)

	1921	1922	1923	1924	1925	1926	1927
January	97	103	108	98	98	97	97
February	99	108	108	100	96	96	96
March	102	114	108	98	97	96	97
April	96	109	106	99	96	97	86
May	97	99	106	98	97	97	97
June	95	105	105	98	99	97	99
July	98	107	102	99	97	98	100
August	97	112	99	98	97	97	98
September	98	110	102	101	98	97	99
October	100	107	102	99	98	98	98
November	103	109	103	98	98	98	96
December	106	108	100	97	98	99	92

FOODS AND TOBACCO GROUP
(Weighted index of seasonally adjusted series)

	1923	1924	1925	1926	1927
January	108	101	97	96	98
February	108	100	96	97	99
March	107	98	97	96	98
April	107	100	96	97	89
May	105	99	99	98	100
June	104	97	99	98	102
July	104	98	97	101	104
August	100	96	98	98	101
September	104	94	97	98	101
October	102	98	99	99	100
November	103	96	98	98	98
December	102	96	98	99	93

STONE, CLAY AND GLASS PRODUCTS GROUP

	1921	1922	1923	1924	1925	1926	1927
January	89.9	79.9	101.1	101.0	96.6	96.5	90.7
February	93.9	89.1	103.1	101.7	99.8	97.4	93.4
March	78.5	87.4	104.8	104.8	98.0	97.7	97.5
April	66.5	89.0	103.7	104.1	98.8	97.5	100.0
May	72.6	91.3	105.5	102.8	96.6	98.5	93.8
June	77.4	93.7	105.1	99.6	97.4	99.0	96.4
July	46.5	97.2	101.2	96.6	95.4	97.6	93.0
August	51.2	95.0	103.0	96.8	93.7	96.0	92.6
September	68.5	78.4	101.2	97.6	95.9	99.8	94.4
October	85.4	94.0	103.1	97.6	96.2	100.6	93.7
November	73.4	96.6	102.9	101.0	95.8	99.1	91.1
December	83.8	96.6	101.9	99.2	95.5	96.4	84.8
Average	74.0	90.7	103.1	100.2	96.6	98.0	93.5

STONE, CLAY AND GLASS PRODUCTS GROUP
(Weighted index of seasonally adjusted series)

	1923	1924	1925	1926	1927
January	103	102	97	97	91
February	104	102	100	97	94
March	104	104	97	97	97
April	103	103	98	97	100
May	105	101	96	97	92
June	106	98	97	98	97
July	104	97	97	99	95
August	106	98	96	98	95
September	102	97	97	101	95
October	102	95	96	100	94
November	101	99	96	99	91
December	102	99	97	96	85

LUMBER PRODUCTS GROUP

	1921	1922	1923	1924	1925	1926	1927
January	80.5	88.6	94.5	100.3	100.7	98.9	82.9
February	78.3	90.5	95.0	99.3	100.7	95.4	80.6
March	79.2	95.4	97.8	97.6	97.8	95.9	80.4
April	81.1	96.5	97.8	93.4	93.7	92.8	81.3
May	77.7	97.1	100.5	92.7	93.9	85.8	83.5
June	78.1	98.3	103.3	96.8	103.5	93.0	88.2
July	84.6	99.4	102.8	93.0	103.1	92.2	86.0
August	80.7	100.3	103.2	98.8	103.3	93.6	88.7
September	80.9	97.2	102.4	99.2	104.0	95.3	90.5
October	86.3	96.3	101.0	97.6	109.5	96.3	89.1
November	94.0	98.1	101.4	98.6	111.2	94.3	83.7
December	96.1	91.2	101.8	102.8	108.2	90.3	81.0
Average	83.1	95.7	100.1	97.5	102.5	93.6	84.7

LUMBER PRODUCTS GROUP
(Adjusted for seasonal variation)

	1921	1922	1923	1924	1925	1926	1927
January	82	90	96	102	103	101	85
February	81	93	98	102	104	98	83
March	81	97	100	100	100	98	82
April	85	101	102	97	98	97	85
May	82	102	106	98	99	90	88
June	77	96	101	95	102	91	87
July	84	98	102	92	102	91	85
August	79	98	101	97	101	92	87
September	79	95	100	97	102	93	89
October	82	92	96	93	104	92	85
November	92	96	99	97	109	93	82
December	94	89	100	101	106	89	79

LUMBER PRODUCTS GROUP
(Weighted index of seasonally adjusted series)

	1923	1924	1925	1926	1927
January	97	103	105	101	86
February	98	102	105	98	83
March	100	102	101	99	83
April	102	98	98	97	86
May	104	97	97	89	88
June	107	97	103	95	94
July	101	90	100	92	88
August	101	95	101	94	91
September	99	96	101	95	91
October	96	93	105	94	87
November	97	96	108	93	81
December	99	101	106	90	81

CHEMICAL PRODUCTS GROUP

	1921	1922	1923	1924	1925	1926	1927
January	100.1	95.3	100.7	99.2	98.3	103.2	108.6
February	96.7	89.1	101.8	100.5	96.6	109.1	107.6
March	90.5	81.2	102.5	101.0	97.9	110.3	109.9
April	91.1	93.0	101.0	101.5	96.7	108.1	108.5
May	89.9	95.3	104.3	99.8	96.2	107.2	104.4
June	87.3	96.6	106.5	97.8	96.8	109.7	95.6
July	81.1	82.5	109.5	95.9	96.3	110.4	97.6
August	80.5	71.9	104.3	95.0	97.1	108.5	102.9
September	80.2	74.5	102.4	93.6	101.3	112.2	92.9
October	89.3	84.5	105.2	96.6	99.8	110.7	94.1
November	95.3	85.6	104.2	96.3	101.0	111.9	95.1
December	98.8	97.4	102.7	97.8	101.8	106.9	95.3
Average	90.1	87.2	103.8	97.9	98.3	109.0	101.0

CHEMICAL PRODUCTS GROUP
(Weighted index of seasonally adjusted series)

	1923	1924	1925	1926	1927
January	105	100	96	103	106
February	105	100	96	107	106
March	104	99	99	108	106
April	102	100	97	106	106
May	103	99	97	106	103
June	106	97	98	108	97
July	109	95	98	110	99
August	104	93	98	106	102
September	103	92	102	109	94
October	104	94	101	109	95
November	104	95	103	109	96
December	105	96	103	105	96

LEATHER AND RUBBER PRODUCTS GROUP

	1921	1922	1923	1924	1925	1926	1927
January	81.3	136.9	114.7	100.6	95.8	96.8	95.0
February	81.5	138.6	114.4	102.1	98.4	99.4	97.2
March	88.5	133.7	115.0	100.3	100.1	98.3	98.0
April	94.2	128.1	113.4	98.1	98.6	97.3	95.7
May	103.7	114.4	111.6	94.8	94.8	95.8	93.2
June	102.5	112.5	110.6	91.6	92.0	94.7	90.9
July	110.6	108.2	108.6	91.4	92.5	94.0	94.0
August	112.7	103.3	104.9	93.2	93.7	95.4	98.4
September	118.5	97.3	103.1	94.4	95.2	95.6	99.9
October	123.0	95.6	104.5	95.5	95.6	93.5	99.6
November	126.4	99.2	102.9	95.2	94.0	93.1	101.8
December	127.3	107.9	99.7	94.8	94.0	94.5	100.7
Average	105.9	114.6	108.6	96.0	95.4	95.7	97.0

LEATHER AND RUBBER PRODUCTS GROUP
(Adjusted for seasonal variation)

	1921	1922	1923	1924	1925	1926	1927
January	81	136	114	100	95	96	94
February	79	135	111	99	96	97	94
March	85	129	111	96	96	95	94
April	92	126	111	96	97	95	94
May	106	117	114	97	97	98	95
June	106	116	114	94	95	98	94
July	114	112	112	94	95	97	97
August	115	105	107	95	96	97	100
September	119	97	103	94	95	96	100
October	122	95	104	95	95	93	99
November	128	100	104	96	95	94	103
December	127	108	100	95	94	95	101

LEATHER AND RUBBER PRODUCTS GROUP
(Weighted index of seasonally adjusted series)

	1923	1924	1925	1926	1927
January	115	101	96	94	93
February	112	101	96	95	94
March	113	99	98	94	95
April	112	98	98	94	94
May	112	95	95	94	92
June	114	95	94	95	91
July	110	93	93	93	93
August	104	94	94	93	97
September	103	95	94	93	99
October	105	96	95	92	98
November	104	96	94	92	101
December	101	96	94	93	101

PAPER AND PRINTING GROUP

	1921	1922	1923	1924	1925	1926	1927
January	102.9	86.6	98.6	100.7	100.8	99.3	96.5
February	100.6	80.4	100.3	99.3	99.7	100.7	94.6
March	98.2	78.8	100.2	99.7	99.5	98.9	94.7
April	91.0	81.6	100.6	99.6	98.5	99.2	93.7
May	91.7	79.5	101.1	99.7	97.9	98.8	94.0
June	91.3	77.5	102.2	99.2	97.5	99.2	95.0
July	93.0	88.2	101.9	98.9	99.7	99.3	94.2
August	81.6	85.2	98.7	99.3	99.4	99.6	94.6
September	80.7	99.1	98.7	100.9	98.6	100.0	95.5
October	83.5	108.8	98.7	101.8	100.9	100.8	96.2
November	94.9	108.3	101.3	102.3	100.8	100.4	95.8
December	85.2	107.1	100.4	102.5	101.2	100.2	99.0
Average	91.2	90.1	100.2	100.3	99.5	99.7	95.3

PAPER AND PRINTING GROUP
(Weighted index of seasonally adjusted series)

	1923	1924	1925	1926	1927
January	97	100	101	100	98
February	100	99	100	102	96
March	100	100	100	100	96
April	101	100	100	100	95
May	101	100	99	100	96
June	102	100	99	101	97
July	101	99	101	100	96
August	98	100	100	100	96
September	98	102	99	101	97
October	98	102	101	101	97
November	100	102	101	101	97
December	100	102	101	100	99

CONSUMERS' GOODS GROUP

	1923	1924	1925	1926	1927
January	104.1	98.7	99.2	98.8	99.1
February	105.8	100.6	100.6	101.1	98.7
March	106.9	100.5	100.5	100.4	99.1
April	105.7	98.9	99.3	99.2	95.1
May	105.1	96.5	99.4	97.7	98.1
June	105.1	92.4	99.3	98.2	98.2
July	104.3	88.3	98.2	98.9	96.8
August	100.8	90.5	99.6	99.5	97.7
September	101.3	94.0	100.9	101.6	97.8
October	101.8	97.4	103.6	103.7	96.0
November	101.3	97.6	101.7	104.7	95.9
December	100.1	99.3	100.7	101.0	94.6
Average	103.5	96.2	100.3	100.4	97.3

CONSUMERS' GOODS GROUP
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	105	100	100	100	100
February	104	99	99	99	97
March	105	99	99	98	97
April	106	99	99	99	95
May	106	98	100	99	99
June	106	93	100	99	99
July	106	90	100	101	99
August	102	91	101	101	99
September	101	94	101	102	98
October	101	96	103	103	95
November	100	97	101	104	95
December	100	99	101	101	95

CONSUMERS' GOODS GROUP
(Weighted index of seasonally adjusted series)

	1923	1924	1925	1926	1927
January	101	104	100	99	101
February	102	103	100	100	100
March	103	103	100	100	101
April	103	102	100	99	98
May	103	100	101	98	101
June	104	95	101	100	103
July	109	89	100	100	101
August	103	89	100	99	99
September	102	90	99	101	98
October	102	95	103	104	97
November	102	95	101	106	98
December	103	97	100	102	97

PRODUCERS' GOODS GROUP

	1923	1924	1925	1926	1927
January	105.5	98.5	97.1	97.5	96.4
February	107.5	100.0	98.6	99.2	96.6
March	109.3	100.9	98.9	98.9	96.2
April	108.5	99.9	97.6	98.3	93.5
May	110.5	95.9	96.5	97.0	91.6
June	112.4	92.1	96.0	96.2	90.3
July	111.3	89.6	93.6	95.7	88.8
August	111.5	90.1	93.0	96.6	87.6
September	110.6	90.7	94.2	98.0	86.6
October	110.4	92.2	95.4	98.6	86.1
November	108.4	92.3	95.7	97.8	86.1
December	102.6	94.8	97.7	97.3	84.7
Average	109.0	94.8	96.2	97.6	90.4

PRODUCERS' GOODS GROUP
(Weighted index of seasonally adjusted series)

	1923	1924	1925	1926	1927
January	106	101	97	98	95
February	106	101	97	98	94
March	108	101	97	97	94
April	107	100	97	96	92
May	109	96	96	95	91
June	111	93	97	95	90
July	111	91	96	96	90
August	112	91	95	97	89
September	110	92	96	99	88
October	110	93	97	99	87
November	107	92	96	97	87
December	103	95	98	96	86

Blast Furnaces

	1923	1924	1925	1926	1927
January	105.1	113.2	100.2	75.1	76.5
February	106.8	126.3	99.8	71.7	79.5
March	109.5	121.7	98.5	71.7	79.4
April	114.3	119.9	94.3	70.5	74.5
May	122.6	112.0	86.3	69.4	71.7
June	123.6	104.9	73.2	71.4	70.5
July	118.7	100.3	72.7	69.2	69.2
August	117.1	97.9	66.8	68.3	64.4
September	122.9	91.9	62.6	72.4	57.6
October	122.3	90.9	59.6	77.8	56.6
November	125.7	90.8	54.8	80.0	50.0
December	119.8	93.1	59.6	75.1	50.0
Average	117.4	105.2	77.4	72.7	66.7

Steel Works and Rolling Mills

	1923	1924	1925	1926	1927
January	103.9	107.4	100.8	90.8	90.1
February	104.4	111.0	102.3	95.1	90.6
March	106.7	111.4	100.6	94.6	90.6
April	105.6	111.4	98.7	95.3	89.4
May	106.5	103.2	95.3	94.3	87.8
June	107.1	95.4	91.9	93.2	85.7
July	102.5	88.6	87.4	91.3	83.7
August	105.9	90.3	85.9	92.3	80.6
September	111.3	91.8	88.2	92.7	81.2
October	111.7	92.2	89.7	92.5	80.3
November	109.4	91.8	90.8	90.4	79.6
December	108.5	96.5	94.0	88.8	78.0
Average	107.0	99.3	93.8	92.6	84.8

Steel Works and Rolling Mills
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	104	107	101	91	90
February	100	107	98	91	87
March	103	107	97	91	87
April	103	108	96	93	87
May	104	101	93	93	86
June	107	95	92	93	86
July	107	92	91	95	87
August	110	94	90	96	84
September	115	95	91	96	84
October	114	94	92	94	82
November	111	93	92	91	80
December	107	96	93	88	77

Iron and Steel Forgings

	1923	1924	1925	1926	1927
January	105.3	103.8	102.1	102.1	96.9
February	107.0	103.0	104.7	102.6	92.2
March	107.1	102.3	99.0	117.5	92.3
April	112.1	102.8	98.9	118.2	91.5
May	114.6	95.1	98.0	100.8	89.7
June	118.7	89.3	97.2	88.8	87.1
July	121.2	84.6	92.4	86.7	84.0
August	111.4	85.7	90.0	86.1	83.0
September	96.1	87.3	91.9	89.2	76.0
October	96.2	91.5	96.9	89.9	74.3
November	98.2	94.3	100.3	87.9	81.4
December	98.2	96.0	106.1	87.8	83.0
Average	107.2	94.6	98.1	96.6	86.0

Iron and Steel Forgings
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	100	99	97	97	92
February	102	98	100	98	88
March	102	97	94	112	88
April	106	97	93	112	86
May	111	92	95	98	87
June	118	88	96	88	86
July	128	89	97	91	88
August	119	91	96	94	88
September	105	95	100	97	83
October	99	94	100	93	77
November	100	96	102	90	83
December	99	97	107	89	84

Structural Iron Work

	1923	1924	1925	1926	1927
January	96.7	93.8	91.8	99.8	90.6
February	100.5	96.5	88.9	97.8	92.5
March	101.8	98.9	90.7	97.7	91.9
April	100.1	100.4	93.8	98.5	92.5
May	104.3	100.4	94.9	100.1	95.9
June	107.7	99.4	99.2	101.4	100.8
July	113.3	98.8	98.8	104.0	99.4
August	115.5	100.0	97.7	110.2	97.3
September	116.6	102.2	96.7	108.8	95.9
October	116.7	92.8	100.3	104.0	95.8
November	111.2	90.4	97.9	107.2	95.1
December	100.6	90.1	99.5	97.1	90.4
Average	107.1	97.0	95.9	102.2	94.8

Structural Iron Work
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	105	102	100	109	99
February	107	103	95	104	98
March	105	102	94	101	95
April	102	102	96	101	94
May	104	100	95	100	96
June	106	98	97	99	99
July	109	95	95	100	96
August	110	95	93	105	93
September	109	96	90	102	90
October	113	90	97	101	93
November	109	89	96	105	93
December	105	94	104	101	94

Steam and Hot Water Heating Apparatus

	1923	1924	1925	1926	1927
January	90.6	99.5	93.0	107.3	95.7
February	96.7	96.5	99.1	108.5	95.9
March	101.6	98.8	97.7	109.1	95.3
April	102.4	101.4	98.7	110.1	93.5
May	105.3	100.6	98.7	108.5	91.8
June	106.2	101.0	101.1	101.6	92.8
July	103.9	96.1	99.2	101.9	92.3
August	107.5	97.6	101.7	102.8	91.6
September	109.2	94.1	101.2	109.4	91.9
October	110.8	93.7	104.7	106.5	87.5
November	106.2	87.2	101.7	101.4	82.3
December	96.7	93.3	105.9	97.5	82.6
Average	103.1	96.7	100.2	105.4	91.1

Stoves and Furnaces

	1923	1924	1925	1926	1927
January	88.9	101.5	80.5	78.2	81.8
February	96.5	108.8	107.7	100.5	97.0
March	97.1	107.7	111.1	101.5	99.4
April	99.0	106.8	108.2	101.5	96.5
May	99.6	105.7	106.0	99.3	90.6
June	98.0	104.9	90.0	99.9	92.0
July	92.8	65.2	67.1	76.7	64.8
August	98.1	94.5	92.8	95.3	78.8
September	102.4	99.2	105.9	102.2	88.5
October	104.9	108.0	106.0	104.2	91.7
November	105.0	109.4	107.9	108.3	91.1
December	106.2	109.1	107.1	106.7	83.4
Average	99.0	101.7	99.2	97.8	88.0

STOVES AND FURNACES
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	103	118	94	91	95
February	94	106	105	98	94
March	92	102	105	96	94
April	94	102	103	97	92
May	98	104	104	97	89
June	96	103	88	98	90
July	125	88	91	104	88
August	103	100	98	100	83
September	100	97	104	100	89
October	98	101	99	97	86
November	96	100	99	99	84
December	97	100	98	98	77

FOUNDRIES

	1923	1924	1925	1926	1927
January	108.3	92.5	91.4	97.5	92.4
February	111.5	94.1	96.5	98.8	91.8
March	119.5	97.1	97.9	98.6	93.1
April	118.8	97.2	98.5	98.1	91.4
May	119.5	98.6	98.8	94.7	90.0
June	123.2	95.4	95.2	94.1	88.7
July	121.2	90.1	94.6	95.7	87.1
August	121.6	84.9	91.9	94.6	87.1
September	117.6	81.9	92.9	95.6	85.3
October	108.2	83.2	93.4	94.5	83.7
November	103.3	85.0	93.7	93.6	81.7
December	96.5	89.3	97.1	94.6	81.8
Average	114.1	90.8	95.2	95.9	87.8

FOUNDRIES
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	108	93	91	98	92
February	112	94	97	99	92
March	116	94	95	96	90
April	115	94	96	95	89
May	114	94	94	90	86
June	121	94	93	92	87
July	121	90	95	96	87
August	125	88	95	98	90
September	120	84	95	98	87
October	110	85	95	96	85
November	108	89	98	98	85
December	99	91	99	97	84

MACHINERY AND PARTS

	1923	1924	1925	1926	1927
January	109.0	106.4	90.6	100.8	107.5
February	109.1	105.8	92.0	102.6	106.8
March	108.2	104.6	92.9	103.4	105.1
April	107.8	100.5	92.4	103.5	101.4
May	109.5	98.4	93.2	104.2	101.1
June	111.1	94.1	93.8	105.1	100.3
July	114.5	91.9	93.7	106.7	97.8
August	115.4	91.2	91.4	107.6	92.9
September	115.4	89.2	92.3	107.5	93.7
October	112.1	88.0	94.9	109.1	93.7
November	110.7	86.5	96.7	108.5	92.6
December	110.0	88.1	99.1	108.0	95.1
Average	111.1	95.4	93.6	105.6	99.0

ELECTRICAL APPARATUS

	1923	1924	1925	1926	1927
January	76.3	129.1	107.3	83.9	110.7
February	75.6	118.8	96.0	85.5	102.1
March	75.6	114.6	85.7	80.9	96.3
April	75.2	105.3	81.7	77.9	91.3
May	69.9	94.6	79.4	73.8	91.6
June	70.3	84.2	87.7	83.9	108.8
July	128.8	77.8	96.9	100.0	119.4
August	119.3	82.1	109.2	113.7	122.0
September	120.0	89.3	118.5	138.1	127.0
October	119.2	107.8	129.0	153.6	98.7
November	121.8	109.7	109.2	166.5	109.3
December	127.7	113.3	93.2	124.4	106.7
Average	98.3	102.2	99.5	106.8	107.0

ELECTRICAL APPARATUS
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	79	133	111	87	114
February	82	129	104	93	111
March	87	132	99	93	111
April	92	128	100	95	111
May	86	117	98	91	113
June	84	100	104	100	130
July	129	78	97	100	119
August	105	72	96	100	107
September	99	74	98	114	105
October	103	93	111	132	85
November	106	95	95	145	95
December	115	102	84	112	96

ENGINES AND PUMPS

	1923	1924	1925	1926	1927
January	107.3	104.5	89.0	88.8	101.3
February	108.1	104.6	92.7	89.2	105.3
March	111.8	102.2	91.5	91.9	104.8
April	116.4	101.5	91.3	93.2	96.5
May	118.4	98.2	93.6	94.0	95.9
June	119.4	95.5	93.1	97.3	97.8
July	118.5	94.7	93.9	99.2	96.6
August	118.0	95.6	95.1	102.2	97.3
September	108.9	93.2	92.5	105.3	86.2
October	108.2	91.0	88.6	102.9	89.6
November	110.2	89.8	85.7	101.5	88.0
December	102.8	89.0	85.9	101.2	84.5
Average	112.3	96.7	91.1	97.2	95.3

HARDWARE AND TOOLS

	1923	1924	1925	1926	1927
January	103.4	91.3	100.9	99.2	90.3
February	106.2	105.1	102.0	103.2	93.0
March	109.2	108.7	100.9	103.8	93.0
April	109.6	104.8	99.4	100.7	93.7
May	108.6	98.0	97.7	95.9	92.0
June	109.3	90.3	96.9	94.7	89.9
July	114.6	83.3	95.9	93.3	79.9
August	108.7	84.8	96.3	93.3	87.6
September	106.4	87.1	96.0	94.1	87.4
October	105.3	91.0	97.8	93.3	84.7
November	100.9	92.8	98.9	92.6	83.8
December	100.6	98.3	101.7	90.1	83.1
Average	106.9	94.5	98.7	96.2	88.2

HARDWARE AND TOOLS
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	106	93	103	101	92
February	101	100	97	98	89
March	105	103	97	100	89
April	106	102	97	98	91
May	107	96	96	94	90
June	110	91	98	96	91
July	118	86	99	96	82
August	109	87	98	95	89
September	108	88	97	95	88
October	106	92	99	94	86
November	103	95	101	95	86
December	103	100	104	92	85

BRASS AND BRONZE PRODUCTS

	1923	1924	1925	1926	1927
January	95.9	108.8	102.0	97.3	81.4
February	102.7	81.1	103.8	96.6	80.9
March	103.7	84.5	109.4	97.4	81.7
April	110.1	86.0	108.0	99.3	81.4
May	111.6	88.8	107.1	94.3	81.4
June	113.4	88.2	106.9	96.8	84.3
July	117.8	86.4	101.1	93.8	85.3
August	115.2	83.6	97.4	94.8	81.5
September	103.9	88.0	101.3	93.7	83.3
October	98.7	91.5	103.0	91.8	85.8
November	95.9	95.8	100.9	86.9	82.3
December	106.3	97.9	102.6	82.7	80.1
Average	106.3	90.1	103.6	93.8	82.5

AUTOMOBILES

	1923	1924	1925	1926	1927
January	96.8	80.5	101.7	105.7	93.5
February	102.0	86.2	111.4	106.9	88.4
March	108.6	90.4	115.0	108.9	95.5
April	107.1	92.5	120.5	117.8	100.0
May	108.1	93.1	122.0	116.2	102.3
June	103.7	93.7	121.6	114.4	98.0
July	98.6	87.3	111.8	107.0	86.3
August	90.7	87.8	101.0	100.7	76.3
September	88.4	90.2	109.5	89.6	75.6
October	85.1	89.7	118.4	82.3	68.1
November	87.3	93.3	115.6	80.7	66.5
December	83.1	97.3	109.7	81.6	71.4
Average	96.6	90.2	113.2	101.0	85.2

AUTOMOBILES
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	99	82	104	108	95
February	104	88	114	109	90
March	102	85	108	102	89
April	97	83	109	106	90
May	98	85	111	106	93
June	96	87	113	106	91
July	98	86	111	106	85
August	96	92	106	106	80
September	94	96	117	95	80
October	93	98	129	90	74
November	93	99	123	86	71
December	90	106	119	89	78

AUTOMOBILE BODIES AND PARTS

	1923	1924	1925	1926	1927
January	115.3	91.2	94.3	101.2	77.4
February	118.1	88.0	95.7	112.4	76.3
March	119.0	91.0	103.0	114.2	74.2
April	114.8	95.4	110.5	112.1	75.3
May	115.4	85.9	113.8	112.7	72.5
June	94.8	76.2	128.0	106.6	74.0
July	90.3	76.3	130.0	90.7	72.4
August	89.9	77.3	126.0	90.3	70.0
September	76.1	81.8	125.1	94.4	69.2
October	77.0	98.6	129.3	87.4	68.7
November	94.4	92.4	101.9	80.3	69.7
December	88.9	93.9	101.8	78.8	72.1
Average	99.5	87.3	113.3	98.4	72.7

LOCOMOTIVES AND CARS

	1923	1924	1925	1926	1927
January	144.1	81.6	70.2	82.8	88.8
February	151.9	70.4	74.1	84.4	93.7
March	157.4	71.0	80.0	85.1	91.9
April	156.9	74.7	76.8	89.1	85.0
May	159.5	77.3	76.4	88.1	81.7
June	165.6	77.7	75.4	81.8	77.8
July	170.6	77.8	72.6	83.9	79.7
August	171.6	74.0	70.8	86.2	80.0
September	157.5	68.0	68.6	84.2	75.9
October	150.8	67.8	69.5	84.4	74.3
November	139.9	67.6	69.9	82.4	72.7
December	118.5	69.6	73.7	85.8	69.9
Average	153.7	73.1	73.2	84.9	81.0

RAILROAD REPAIR SHOPS

	1923	1924	1925	1926	1927
January	108.6	92.8	99.6	95.6	95.2
February	108.7	97.1	99.9	96.9	94.4
March	108.7	99.2	99.7	97.5	90.7
April	106.2	97.6	97.6	96.5	87.8
May	108.6	95.1	96.3	94.0	87.1
June	114.1	93.1	95.5	94.2	86.3
July	114.2	93.6	92.4	94.2	85.4
August	112.5	93.3	91.8	93.4	83.5
September	109.1	93.9	92.2	94.1	82.6
October	110.0	95.7	93.0	95.0	82.4
November	109.6	96.6	93.6	95.8	83.4
December	95.9	98.2	94.5	96.0	83.3
Average	108.9	95.5	95.5	95.3	86.8

SHIPBUILDING

	1923	1924	1925	1926	1927
January	111.3	132.1	65.6	96.3	114.5
February	124.8	140.8	54.9	93.9	112.7
March	119.4	140.2	57.3	92.5	117.3
April	124.9	133.3	58.2	103.1	114.6
May	128.2	107.6	68.4	107.7	97.7
June	128.4	99.5	72.0	107.4	89.9
July	128.3	102.1	73.8	112.3	79.2
August	120.9	96.7	80.5	116.7	77.4
September	115.3	87.9	78.7	113.5	64.4
October	116.6	85.0	79.3	121.9	46.5
November	116.2	75.3	84.2	122.2	44.2
December	126.5	70.3	94.6	125.6	42.2
Average	121.7	105.9	72.3	109.4	83.4

COTTON GOODS

	1923	1924	1925	1926	1927
January	118.8	98.0	97.0	95.9	96.8
February	121.9	95.7	100.6	97.3	96.3
March	122.0	95.9	101.0	97.3	97.8
April	118.6	96.5	100.7	98.8	97.0
May	112.5	93.3	100.3	96.0	95.0
June	107.4	89.2	98.1	92.0	93.9
July	102.9	75.4	97.5	90.1	93.5
August	102.9	80.2	100.0	90.0	92.7
September	105.5	86.0	98.2	88.5	93.9
October	106.9	90.1	100.4	92.1	94.2
November	99.5	92.1	100.6	94.9	89.3
December	101.4	95.6	98.1	96.0	91.4
Average	110.0	90.7	99.4	94.1	94.3

COTTON GOODS
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	115	95	94	93	94
February	120	94	99	95	94
March	118	93	98	95	95
April	115	94	98	96	94
May	111	92	99	95	94
June	110	91	100	94	96
July	108	79	103	95	98
August	108	84	105	95	98
September	107	87	99	89	95
October	107	90	100	92	94
November	100	92	101	95	89
December	100	95	97	95	91

WOOLENS AND WORSTEDS

	1923	1924	1925	1926	1927
January	128.8	107.4	101.3	79.1	92.4
February	129.6	108.4	97.8	79.8	94.5
March	124.5	106.7	93.9	78.8	95.5
April	121.4	96.4	84.0	72.3	91.2
May	121.4	90.6	82.3	70.0	86.9
June	117.8	80.4	83.4	69.4	86.6
July	114.6	78.2	82.4	71.9	86.2
August	111.9	81.3	83.3	74.0	92.7
September	112.7	88.3	87.4	79.9	96.2
October	114.9	101.1	83.2	86.5	99.4
November	113.4	100.2	81.7	88.8	101.0
December	110.4	100.4	79.1	88.0	94.0
Average	118.5	94.9	86.6	78.2	93.1

WOOLENS AND WORSTEDS
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	120	100	95	74	86
February	122	102	92	75	90
March	119	102	89	75	91
April	124	98	86	74	93
May	131	97	89	75	93
June	127	87	90	75	93
July	125	85	90	78	94
August	118	86	88	78	93
September	114	89	88	81	97
October	109	96	79	82	95
November	107	95	77	84	95
December	109	99	78	87	93

SILK GOODS

	1923	1924	1925	1926	1927
January	96.6	94.6	97.5	125.1	113.6
February	99.2	92.9	100.3	122.1	106.5
March	100.6	91.8	104.6	114.2	108.3
April	98.8	84.2	107.9	106.0	103.4
May	101.1	80.5	112.3	101.5	102.5
June	99.0	80.5	116.7	102.7	96.0
July	98.9	79.5	115.9	102.7	94.8
August	99.1	82.3	119.4	108.2	98.1
September	98.5	88.2	121.0	113.5	98.5
October	100.2	91.7	123.0	117.0	98.2
November	94.7	93.1	124.6	118.2	104.4
December	90.9	94.2	125.1	120.0	106.5
Average	98.1	87.8	114.0	112.6	102.6

Textile Dyeing and Finishing

	1923	1924	1925	1926	1927
January	99.5	98.8	104.3	110.4	124.1
February	99.9	100.5	109.4	113.5	126.8
March	101.0	101.1	110.6	116.1	131.3
April	102.1	98.5	106.4	113.9	125.8
May	101.3	88.7	105.1	112.4	123.6
June	97.7	88.0	102.8	112.5	121.1
July	97.5	84.2	102.8	107.9	119.1
August	97.3	86.5	101.8	110.8	119.0
September	90.0	89.5	107.0	118.9	115.5
October	97.8	94.1	111.8	124.0	117.0
November	95.3	97.6	112.8	122.5	122.5
December	97.4	105.1	115.4	124.6	121.4
Average	98.1	94.4	107.5	115.7	122.3

Textile Dyeing and Finishing
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	98	97	102	108	122
February	97	98	106	110	123
March	95	95	104	110	124
April	100	97	104	112	123
May	101	89	105	112	124
June	100	90	105	115	124
July	102	88	107	112	124
August	102	91	107	117	125
September	96	95	114	127	123
October	98	94	112	124	117
November	94	97	112	121	121
December	95	102	112	121	118

Carpets and Rugs

	1923	1924	1925	1926	1927
January	108.4	104.1	107.1	99.7	98.7
February	110.3	105.4	106.7	99.7	98.7
March	110.3	106.4	106.8	97.8	99.8
April	112.4	104.4	108.2	98.5	95.9
May	112.4	95.5	106.9	95.9	97.3
June	110.6	65.7	103.5	93.8	92.6
July	111.5	56.0	88.1	84.3	89.1
August	107.4	75.7	89.1	89.7	79.9
September	106.2	90.1	85.1	92.3	82.2
October	105.9	96.9	84.0	92.9	89.1
November	106.7	101.9	96.4	97.4	102.7
December	110.7	104.8	99.0	98.9	103.4
Average	109.4	92.2	98.4	95.1	94.1

CARPETS AND RUGS
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	104	100	103	96	95
February	104	99	101	94	93
March	105	101	102	93	95
April	108	100	104	95	92
May	110	94	105	94	95
June	112	66	105	95	94
July	125	63	99	95	100
August	118	83	98	99	88
September	110	93	88	95	85
October	109	100	87	96	92
November	105	100	95	96	101
December	106	101	95	95	99

HATS

	1923	1924	1925	1926	1927
January	99.6	100.9	95.7	96.5	100.9
February	100.9	97.8	97.9	97.3	101.5
March	102.0	98.5	99.0	94.3	101.3
April	101.4	96.5	98.4	93.0	98.8
May	104.0	96.6	98.6	94.4	102.1
June	106.2	93.4	99.4	96.4	100.4
July	108.6	94.4	99.4	97.6	99.2
August	109.7	97.7	100.8	97.5	99.9
September	104.4	98.4	100.1	98.2	98.5
October	105.0	96.8	97.0	98.1	96.1
November	104.4	96.5	99.6	98.5	96.0
December	102.8	97.6	99.8	97.2	97.2
Average	104.1	97.1	98.8	96.6	99.3

HOSIERY

	1923	1924	1925	1926	1927
January	94.0	97.8	98.5	111.3	115.1
February	95.5	99.2	103.0	111.3	112.3
March	97.7	100.2	107.3	110.9	113.1
April	100.3	97.9	108.9	109.3	113.9
May	98.8	97.4	110.8	108.5	116.8
June	99.1	94.4	108.6	108.8	113.1
July	99.3	88.9	108.3	109.5	105.9
August	97.2	88.3	106.7	108.8	107.0
September	97.4	90.2	108.0	110.7	107.1
October	94.6	92.1	113.3	115.9	114.2
November	96.2	94.1	109.4	117.1	117.5
December	97.7	97.1	112.2	118.7	118.2
Average	97.3	94.8	107.9	111.7	112.9

Knit Goods, Other

	1923	1924	1925	1926	1927
January	106.8	102.9	91.3	88.6	69.7
February	109.9	104.5	95.8	91.2	74.7
March	111.5	107.9	96.0	89.9	76.6
April	112.3	103.9	95.7	89.4	77.0
May	110.6	100.7	96.5	87.3	79.2
June	111.5	95.1	95.2	84.9	79.0
July	110.3	89.0	94.7	81.2	79.5
August	111.1	84.8	96.1	75.3	76.8
September	109.1	84.7	94.0	70.7	77.5
October	108.4	93.4	94.6	76.5	81.7
November	106.8	95.2	93.7	80.0	84.3
December	102.9	93.9	89.5	73.5	81.9
Average	109.3	96.3	94.4	82.4	78.2

Men's Clothing

	1923	1924	1925	1926	1927
January	111.2	109.5	93.9	104.4	109.1
February	117.0	90.0	92.5	103.9	109.0
March	113.0	88.6	97.7	104.0	106.9
April	104.5	85.1	90.1	93.1	107.3
May	113.0	89.5	101.8	89.8	99.7
June	115.5	99.8	104.0	96.6	107.4
July	118.5	91.4	101.9	101.8	110.6
August	102.8	94.5	101.2	101.9	110.4
September	108.0	96.4	102.1	103.1	107.6
October	106.7	95.2	100.7	103.7	107.6
November	94.7	72.0	99.6	100.9	96.4
December	108.9	85.0	103.0	105.0	93.0
Average	109.5	91.4	99.0	100.7	105.4

Women's Clothing

	1923	1924	1925	1926	1927
January	110.5	104.2	100.3	105.0	107.9
February	110.2	101.6	105.8	107.8	122.5
March	110.0	101.2	108.5	105.9	113.8
April	114.3	100.3	105.1	102.3	111.6
May	113.6	100.6	99.1	105.6	107.8
June	107.2	96.0	96.0	105.4	103.5
July	112.9	88.7	91.6	100.9	106.8
August	115.3	89.1	90.7	99.5	98.0
September	103.1	82.6	83.7	97.0	98.9
October	101.9	78.8	97.0	93.6	100.0
November	98.8	92.2	96.9	100.0	108.6
December	101.3	95.0	97.1	104.1	117.2
Average	108.3	94.2	97.6	102.2	108.1

SHIRTS AND FURNISHINGS

	1923	1924	1925	1926	1927
January	94.1	107.7	86.3	110.7	100.5
February	96.8	108.0	92.5	110.4	94.3
March	101.5	109.9	97.9	110.4	96.4
April	98.7	107.9	105.5	103.0	92.3
May	93.2	105.7	109.7	102.7	94.0
June	109.4	88.6	107.1	96.3	94.9
July	108.1	77.5	100.5	92.2	93.4
August	101.3	81.5	99.6	90.2	92.4
September	106.7	91.7	101.1	101.1	96.7
October	110.2	88.3	103.5	101.8	92.4
November	113.4	81.1	106.5	104.4	100.2
December	113.6	84.4	109.7	105.5	99.3
Average	103.9	94.4	101.7	102.4	95.6

BREAD AND BAKERY PRODUCTS

	1923	1924	1925	1926	1927
January	93.8	98.6	98.2	97.4	106.2
February	95.4	100.2	98.4	98.3	107.9
March	99.8	100.1	97.7	98.3	107.9
April	100.8	100.1	96.4	100.2	108.4
May	102.3	100.9	99.3	101.7	110.7
June	102.1	102.2	102.7	104.8	113.0
July	103.1	101.3	101.5	105.4	112.0
August	98.1	99.3	99.2	102.4	110.3
September	103.2	99.7	98.2	103.8	108.4
October	101.3	100.9	100.3	105.6	109.4
November	103.4	99.7	101.2	107.9	108.5
December	101.4	98.8	99.7	109.7	108.1
Average	100.4	100.2	99.4	103.0	109.2

BREAD AND BAKERY PRODUCTS
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	96	101	100	99	108
February	96	101	99	99	109
March	101	101	99	99	109
April	102	101	97	101	110
May	102	101	99	102	111
June	99	99	100	102	110
July	101	99	100	103	110
August	99	100	100	103	111
September	104	101	99	105	110
October	101	101	100	106	109
November	101	98	99	106	106
December	101	99	100	110	108

CONFECTIONERY

	1923	1924	1925	1926	1927
January	107.2	101.0	103.3	100.4	99.7
February	111.9	104.3	105.7	103.6	96.3
March	107.2	99.6	98.3	102.3	89.7
April	95.3	93.3	90.5	92.8	84.5
May	92.8	87.8	90.2	95.5	85.2
June	90.7	90.5	91.3	92.7	87.2
July	90.1	89.5	90.2	92.8	88.0
August	91.1	98.2	93.1	95.6	91.0
September	102.3	107.9	101.8	100.4	98.8
October	111.0	117.1	105.3	108.6	104.6
November	111.9	110.4	103.9	104.9	100.8
December	105.2	109.4	100.4	102.6	102.5
Average	101.4	100.8	97.8	99.4	94.0

CONFECTIONERY
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	105	99	101	98	98
February	107	99	101	99	92
March	107	100	98	102	90
April	103	100	97	100	91
May	102	97	99	105	94
June	99	98	99	101	95
July	98	97	98	101	96
August	95	102	97	100	95
September	98	104	98	97	95
October	100	106	95	98	94
November	104	102	96	97	93
December	99	103	95	97	97

ICE CREAM

	1923	1924	1925	1926	1927
January	92.6	86.5	79.3	83.2	75.8
February	91.9	85.0	81.7	82.9	76.3
March	98.1	89.2	83.9	84.8	84.9
April	99.4	97.8	88.0	95.1	90.2
May	109.0	105.6	95.2	108.2	95.5
June	120.3	109.1	131.6	116.7	93.7
July	126.2	125.7	125.0	120.1	108.6
August	117.9	122.5	111.8	123.3	89.3
September	109.3	116.2	107.5	107.5	92.5
October	94.7	94.2	95.2	96.6	86.0
November	87.7	83.8	86.4	80.6	80.1
December	87.7	77.2	86.8	77.0	76.8
Average	102.9	99.4	97.7	98.0	87.5

Ice Cream
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	109	102	93	98	89
February	108	100	96	98	90
March	110	100	94	95	95
April	103	101	91	98	93
May	103	100	90	102	90
June	103	93	113	100	80
July	101	101	100	96	87
August	103	107	97	107	78
September	99	106	98	98	84
October	98	97	98	100	89
November	101	96	99	93	92
December	101	89	100	89	88

Meat Packing

	1923	1924	1925	1926	1927
January	107.0	105.7	101.3	97.7	98.6
February	105.2	106.4	99.6	95.9	97.1
March	101.9	103.9	95.3	96.4	95.6
April	101.1	103.1	94.2	92.8	94.3
May	101.1	98.7	93.2	94.1	93.4
June	99.4	99.4	92.7	94.4	96.4
July	103.1	97.1	93.8	94.9	96.2
August	97.8	95.7	94.4	92.7	95.3
September	103.5	97.5	94.4	96.1	97.0
October	105.0	100.4	97.4	98.2	97.2
November	105.1	100.9	100.1	101.0	98.5
December	106.7	101.3	97.3	99.9	98.9
Average	103.1	100.9	96.2	96.2	96.5

Meat Packing
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	104	103	98	95	96
February	103	104	98	94	95
March	103	105	96	97	97
April	104	106	97	96	97
May	104	102	96	97	96
June	101	101	95	96	98
July	104	98	95	96	97
August	101	99	97	96	98
September	104	98	94	96	97
October	103	98	96	96	95
November	102	98	97	98	96
December	104	98	95	97	96

Cigars and Tobacco

	1923	1924	1925	1926	1927
January	117.6	105.9	94.7	95.1	95.1
February	115.2	99.2	93.1	95.7	96.7
March	112.5	94.7	95.9	94.3	96.8
April	109.8	97.0	94.2	94.2	72.7
May	104.8	94.5	96.0	92.9	95.7
June	103.8	91.8	93.3	92.0	98.9
July	100.6	88.6	87.5	94.8	99.0
August	102.9	89.9	97.1	95.6	99.3
September	110.0	95.8	98.8	96.3	102.0
October	104.3	95.2	103.0	97.5	103.0
November	106.6	96.4	100.7	97.6	100.6
December	109.7	96.6	101.6	98.7	87.4
Average	108.2	95.5	96.3	95.4	95.6

Cigars and Tobacco
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	116	105	94	94	94
February	115	99	93	96	97
March	111	94	95	93	96
April	111	98	95	95	73
May	108	97	99	96	99
June	108	96	97	96	103
July	108	95	94	102	107
August	103	90	97	96	99
September	108	84	97	94	100
October	102	93	101	96	101
November	103	93	97	94	97
December	105	92	97	94	83

Brick, Tile and Pottery

	1923	1924	1925	1926	1927
January	104.4	104.3	97.8	93.6	94.3
February	104.9	104.9	100.1	93.6	93.5
March	104.8	107.1	99.5	94.6	99.5
April	105.6	106.6	100.1	96.0	99.4
May	107.6	102.5	94.6	97.2	85.7
June	106.3	97.5	95.3	96.7	99.6
July	105.0	95.4	92.5	97.7	100.3
August	107.1	94.7	92.5	98.0	98.1
September	101.7	97.1	94.4	100.6	97.5
October	102.1	96.6	94.2	102.6	95.5
November	98.8	98.6	94.1	102.3	92.7
December	99.2	97.4	95.2	98.8	89.8
Average	104.0	100.2	95.9	97.6	95.5

Cement

	1923	1924	1925	1926	1927
January	87.8	97.5	99.0	106.5	104.9
February	89.0	97.8	101.5	107.9	99.4
March	91.8	98.9	100.0	107.9	103.1
April	93.4	100.4	101.5	109.3	104.1
May	96.2	102.0	102.8	110.9	104.7
June	94.8	102.3	104.7	112.2	105.5
July	94.9	104.1	107.7	112.4	106.3
August	96.7	104.9	106.6	111.9	105.6
September	96.6	104.0	107.1	111.1	103.4
October	96.5	104.1	107.2	110.1	99.7
November	98.3	105.0	105.1	109.7	97.8
December	97.3	101.3	103.8	107.8	91.9
Average	94.4	101.9	103.9	109.8	102.2

Cement
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	90	100	101	109	107
February	91	100	104	110	101
March	95	102	103	111	106
April	94	101	103	110	105
May	95	101	102	110	104
June	94	101	104	111	105
July	93	102	106	110	104
August	95	103	105	110	104
September	96	103	106	110	102
October	96	103	106	109	99
November	97	104	104	109	97
December	98	102	105	109	93

Glass

	1923	1924	1925	1926	1927
January	107.5	99.5	94.2	93.7	80.2
February	111.6	101.3	98.9	94.7	91.9
March	113.5	106.5	96.8	94.8	95.3
April	108.7	104.2	97.9	92.4	100.6
May	109.9	102.1	95.1	92.6	93.0
June	111.8	97.1	95.6	93.2	90.5
July	102.0	89.9	90.9	88.9	80.8
August	103.4	90.2	88.1	85.4	82.0
September	102.4	91.8	92.5	93.6	88.4
October	108.0	92.3	94.1	95.1	91.2
November	107.7	98.8	95.4	92.1	88.1
December	106.4	98.5	95.7	88.9	78.9
Average	107.7	97.7	94.6	92.1	88.4

GLASS
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	109	101	95	95	81
February	111	100	98	94	91
March	108	101	92	90	91
April	106	101	95	90	98
May	108	100	93	91	91
June	112	97	96	93	91
July	109	96	97	95	86
August	111	97	95	92	88
September	105	94	94	96	90
October	106	91	92	93	89
November	106	97	94	90	86
December	105	98	95	88	78

LUMBER AND PLANING MILLS

	1923	1924	1925	1926	1927
January	88.2	99.8	94.9	101.8	76.4
February	88.9	96.0	94.7	95.7	76.4
March	92.6	91.7	98.6	95.5	75.2
April	93.2	90.9	94.5	91.8	76.4
May	100.1	89.9	97.9	86.4	77.4
June	101.2	108.9	119.0	96.0	80.7
July	103.6	104.0	113.7	88.2	77.3
August	106.7	109.3	108.7	87.2	77.5
September	104.0	102.2	104.0	87.3	77.8
October	97.8	96.1	108.3	85.6	76.8
November	100.0	93.0	108.2	82.8	77.7
December	100.7	96.4	102.1	79.7	72.1
Average	98.1	98.2	103.7	89.9	76.8

LUMBER AND PLANING MILLS
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	92	104	99	106	80
February	93	100	99	100	80
March	97	96	103	100	78
April	97	95	98	96	80
May	103	93	101	89	80
June	96	103	112	91	76
July	98	98	107	83	73
August	102	104	104	83	74
September	102	100	102	86	76
October	97	95	107	85	76
November	99	92	107	82	77
December	103	98	104	81	74

Furniture

	1923	1924	1925	1926	1927
January	99.0	102.3	109.6	92.1	83.8
February	99.1	101.3	108.7	90.9	77.6
March	101.1	104.1	97.9	92.6	78.1
April	99.8	94.2	94.8	90.0	79.5
May	99.1	93.2	92.1	79.2	84.4
June	104.4	82.8	90.9	84.2	92.3
July	100.9	79.6	95.2	89.1	91.4
August	100.6	87.0	99.5	93.5	94.8
September	102.0	94.7	103.9	97.9	97.9
October	104.1	98.2	111.6	102.0	95.1
November	103.0	104.0	114.2	101.6	79.6
December	103.0	111.1	114.0	96.1	85.8
Average	101.3	96.0	102.7	92.4	86.7

Furniture
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	101	104	112	94	86
February	101	103	111	93	79
March	103	106	100	95	80
April	105	99	100	95	84
May	104	98	97	83	89
June	116	92	101	94	103
July	104	82	98	92	94
August	102	88	101	94	96
September	98	91	100	94	94
October	95	89	102	93	87
November	95	96	106	94	74
December	95	103	106	89	79

Wooden Boxes

	1923	1924	1925	1926	1927
January	96.0	94.2	94.9	115.0	112.3
February	98.0	98.6	98.7	115.1	115.5
March	99.0	100.0	98.6	113.7	117.1
April	104.8	103.1	88.6	111.0	114.1
May	100.6	105.2	85.0	111.9	112.5
June	100.5	99.7	85.0	116.2	112.6
July	99.6	99.2	88.0	127.4	110.6
August	95.7	100.5	94.9	128.1	123.2
September	95.5	106.4	106.6	126.5	128.0
October	103.0	104.7	110.1	126.6	129.9
November	100.9	106.1	117.1	122.6	130.0
December	100.8	102.8	116.8	120.1	110.4
Average	99.5	101.7	98.7	119.5	118.0

CHEMICALS AND DRUGS

	1923	1924	1925	1926	1927
January	123.7	106.8	86.4	95.4	88.6
February	121.4	100.7	90.6	96.3	91.9
March	123.9	106.0	104.6	100.9	93.1
April	113.8	101.3	98.7	96.6	90.6
May	106.4	97.7	94.0	95.8	86.3
June	106.0	91.8	91.3	90.5	86.1
July	106.0	84.8	89.3	92.8	83.4
August	108.8	83.3	92.7	85.2	86.8
September	108.2	86.4	95.0	88.7	88.3
October	105.9	83.9	97.7	91.4	87.5
November	103.8	86.7	100.0	90.1	88.9
December	113.6	87.2	96.9	88.7	89.2
Average	112.2	93.1	94.8	92.7	88.4

CHEMICALS AND DRUGS
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	124	107	86	95	89
February	120	100	89	95	91
March	116	99	98	94	87
April	111	98	96	94	88
May	105	97	93	95	85
June	109	95	94	93	89
July	112	89	94	98	88
August	111	85	95	87	89
September	109	87	96	90	88
October	107	85	99	92	87
November	109	87	100	90	88
December	114	87	97	89	88

COKE

	1923	1924	1925	1926	1927
January	81.5	93.9	124.3	97.4	106.8
February	83.0	96.4	112.9	97.1	107.0
March	84.3	98.5	110.7	97.5	107.6
April	80.6	97.4	111.7	93.0	109.3
May	87.8	96.8	108.8	95.5	101.7
June	89.0	99.7	104.6	100.9	98.2
July	87.2	109.3	98.0	100.2	105.7
August	90.2	113.1	98.8	101.6	101.8
September	91.0	112.8	103.5	107.2	102.1
October	93.9	116.5	102.6	106.2	110.1
November	95.9	114.3	100.7	109.8	112.2
December	93.4	117.8	98.9	107.1	115.9
Average	88.2	105.6	106.3	101.1	106.5

Explosives

	1923	1924	1925	1926	1927
January	111.7	95.3	94.0	96.8	140.5
February	117.9	92.5	97.0	96.0	130.8
March	114.4	90.6	103.8	96.2	127.9
April	109.8	91.8	101.6	95.2	128.1
May	108.4	89.7	99.2	94.0	133.8
June	106.8	88.5	99.0	96.4	130.6
July	112.2	87.4	98.2	102.0	125.7
August	112.0	89.5	100.6	106.6	125.7
September	107.5	92.6	95.4	117.9	123.5
October	106.2	93.6	95.7	123.1	122.5
November	104.1	96.7	96.8	131.3	125.1
December	98.4	100.0	100.4	134.3	130.6
Average	109.1	92.4	98.5	107.5	128.7

Paints and Varnishes

	1923	1924	1925	1926	1927
January	99.6	97.9	102.1	122.1	124.8
February	101.5	106.0	97.5	129.1	123.9
March	102.2	99.7	96.2	128.3	132.9
April	103.4	107.0	93.5	132.5	138.1
May	105.5	105.6	94.6	135.4	142.5
June	107.0	103.6	97.9	148.0	137.9
July	105.5	100.7	106.4	153.1	138.7
August	83.9	98.8	106.0	154.0	137.4
September	84.5	92.5	104.2	146.8	137.0
October	91.4	96.6	103.7	138.3	137.3
November	90.4	96.8	108.2	132.0	136.6
December	103.2	95.9	108.5	127.3	130.9
Average	98.2	100.1	101.6	137.2	134.8

Petroleum Refining

	1923	1924	1925	1926	1927
January	98.7	98.9	92.3	108.1	112.6
February	100.1	100.7	93.4	118.1	110.8
March	100.6	100.9	94.2	119.2	113.7
April	101.8	102.7	93.4	117.3	110.2
May	106.2	101.0	94.6	114.5	105.6
June	109.9	98.0	97.5	116.6	91.5
July	115.6	92.8	98.7	116.6	93.4
August	108.0	90.5	99.4	113.9	103.9
September	104.7	88.4	105.5	117.8	85.0
October	108.6	92.4	102.6	115.6	84.6
November	106.3	92.4	104.6	117.0	85.0
December	103.2	93.7	107.6	109.8	84.4
Average	105.3	96.0	98.7	115.4	98.4

LEATHER TANNING

	1923	1924	1925	1926	1927
January	121.8	103.6	91.4	102.3	102.9
February	120.0	102.1	93.5	102.5	101.8
March	119.9	97.7	95.1	100.4	101.6
April	119.4	93.0	93.9	100.7	99.2
May	117.2	93.2	90.5	98.6	96.6
June	115.3	88.8	92.5	97.9	96.9
July	113.9	87.3	91.5	94.9	98.7
August	110.2	86.1	90.0	96.8	101.3
September	107.6	86.9	97.0	98.8	104.3
October	108.6	89.4	98.8	93.3	106.4
November	106.2	89.8	96.7	95.4	108.2
December	103.9	90.6	96.8	100.8	106.2
Average	113.7	92.4	94.0	98.5	102.0

SHOES

	1923	1924	1925	1926	1927
January	110.7	98.8	96.9	90.6	85.3
February	109.7	103.7	100.8	95.5	89.7
March	111.1	104.8	102.3	95.0	90.8
April	108.5	106.6	100.2	92.1	87.2
May	107.3	97.8	94.4	89.6	85.7
June	108.1	92.4	88.0	88.3	80.6
July	110.2	92.6	91.6	89.7	86.4
August	109.2	96.9	94.3	90.3	93.7
September	106.7	97.9	89.9	88.5	94.2
October	106.8	96.8	90.0	88.5	94.8
November	103.8	97.8	88.9	85.8	93.5
December	97.8	96.6	89.0	85.4	93.3
Average	107.5	98.6	93.9	89.9	89.6

SHOES

(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	111	99	97	91	85
February	106	100	97	92	86
March	106	100	97	91	87
April	106	105	98	90	86
May	108	99	95	91	87
June	115	98	94	94	86
July	112	95	94	92	88
August	108	96	93	89	93
September	107	98	90	89	94
October	107	97	90	89	95
November	105	99	90	87	94
December	100	99	91	87	97

Leather Products, Other

	1923	1924	1925	1926	1927
January	92.9	113.2	98.9	107.6	113.9
February	95.9	112.2	95.1	111.9	126.1
March	107.9	113.5	94.9	110.7	128.1
April	102.3	104.8	90.5	110.4	124.4
May	100.2	91.8	92.3	108.7	111.3
June	98.4	86.3	97.3	107.6	104.4
July	96.5	87.9	98.6	105.0	110.1
August	101.0	82.3	101.2	104.6	120.3
September	100.3	86.4	106.6	112.8	122.6
October	111.6	91.2	109.5	126.0	89.8
November	120.3	93.7	108.9	129.8	133.7
December	114.7	91.9	107.9	121.5	127.0
Average	103.5	96.3	100.1	113.0	117.6

Rubber Tires and Goods

	1923	1924	1925	1926	1927
January	122.4	89.5	103.2	73.6	82.9
February	130.5	92.6	105.4	77.0	86.6
March	126.6	86.4	109.1	78.5	90.0
April	122.2	79.3	111.6	78.3	94.3
May	117.9	87.0	113.0	82.8	93.8
June	113.7	102.5	96.9	81.0	93.1
July	86.5	106.7	95.4	83.7	89.0
August	63.5	116.2	103.0	86.3	87.3
September	67.6	117.1	99.8	82.5	85.6
October	73.7	117.8	93.4	81.9	84.8
November	77.4	105.2	92.3	76.8	84.1
December	81.8	99.7	93.0	71.2	86.0
Average	98.7	100.0	101.3	79.5	88.1

Paper and Wood Pulp

	1923	1924	1925	1926	1927
January	99.9	100.1	100.9	96.6	89.9
February	102.0	98.1	99.7	97.0	88.3
March	101.3	98.4	98.5	97.4	88.3
April	101.9	99.9	96.9	98.0	88.3
May	102.2	98.9	97.5	98.1	88.6
June	104.3	98.5	97.8	99.0	88.6
July	104.8	99.2	99.3	98.7	88.3
August	102.3	99.2	99.9	98.7	89.4
September	101.9	100.3	99.0	98.0	88.2
October	99.6	100.5	98.9	98.0	87.4
November	102.4	100.4	98.0	96.4	86.5
December	99.8	100.8	97.7	94.9	92.5
Average	101.9	99.5	98.7	97.6	88.7

Paper Boxes and Bags

	1923	1924	1925	1926	1927
January	102.7	100.6	102.9	101.6	104.5
February	105.9	96.6	97.7	99.5	97.7
March	105.6	96.8	94.8	99.8	90.8
April	104.4	93.9	94.1	88.8	90.3
May	99.3	93.2	91.8	95.2	91.0
June	98.4	90.6	92.1	96.4	91.9
July	102.3	89.2	98.7	93.7	95.3
August	100.2	94.0	95.5	94.9	96.7
September	97.0	103.8	94.1	99.9	99.7
October	104.3	106.5	105.1	106.4	107.4
November	109.4	106.8	106.1	108.9	110.6
December	110.0	110.5	105.1	108.6	107.1
Average	103.3	98.5	98.2	99.5	98.6

Paper Boxes and Bags
(Adjusted for seasonal variation)

	1923	1924	1925	1926	1927
January	100	98	100	99	102
February	107	98	99	101	99
March	107	98	96	101	92
April	110	99	99	94	95
May	106	99	98	101	97
June	106	97	99	104	99
July	107	93	103	98	99
August	103	97	99	98	100
September	97	104	94	100	100
October	98	100	98	99	100
November	101	99	98	101	102
December	101	101	96	100	98

Printing and Publishing

	1923	1924	1925	1926	1927
January	94.2	101.2	101.2	103.0	103.6
February	95.4	101.0	101.1	106.2	102.1
March	96.3	101.8	102.7	101.5	103.9
April	96.8	100.5	102.2	103.6	101.5
May	98.0	101.8	100.6	101.3	101.7
June	98.2	101.9	99.0	100.9	104.1
July	96.7	100.6	101.5	102.0	101.6
August	92.6	101.1	100.7	102.3	101.2
September	93.8	101.8	100.0	103.2	103.7
October	95.9	103.3	103.3	104.0	104.9
November	98.1	104.6	103.9	104.3	104.4
December	99.4	104.0	105.4	105.5	104.7
Average	96.3	102.0	101.8	103.2	103.1

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ALL OCCUPATIONS

	1921	1922	1923	1924	1925	1926	1927
January	91.6	79.1	101.6	109.9	98.7	82.4	102.2
February	98.7	86.2	103.0	106.3	101.9	84.4	100.6
March	96.2	92.1	108.7	106.7	100.1	106.5	99.8
April	87.0	52.0	104.4	103.2	96.3	103.5	96.9
May	93.0	45.7	113.9	100.6	103.3	105.1	100.5
June	99.6	46.4	113.2	92.6	99.7	105.5	100.8
July	89.2	48.0	106.6	90.4	96.8	100.1	89.4
August	88.4	51.0	108.7	93.2	99.8	103.4	92.9
September	91.2	61.6	93.2	94.3	81.3	104.8	94.1
October	97.1	98.1	113.8	98.8	83.9	111.1	94.7
November	87.8	97.2	106.4	95.0	81.6	105.4	94.8
December	93.9	102.5	106.3	99.9	84.9	108.9	91.8
Average	92.8	71.7	106.7	99.2	94.0	101.8	96.5

MANUFACTURING

	1923	1924	1925	1926	1927
January	98.0	110.0	98.5	100.0	101.1
February	100.2	101.4	100.1	103.4	103.3
March	106.7	102.5	102.0	105.9	103.8
April	105.1	100.4	98.9	103.3	99.8
May	114.8	95.1	99.1	101.3	97.2
June	113.7	87.1	96.9	101.4	96.0
July	107.7	80.9	93.2	96.8	89.4
August	108.5	85.1	95.3	99.8	92.8
September	107.1	87.4	94.3	101.0	89.3
October	111.5	93.2	101.9	107.4	90.7
November	105.4	91.7	99.6	104.5	90.2
December	102.9	99.7	103.9	105.8	89.9
Average	106.8	94.6	98.7	102.6	95.3

ANTHRACITE

	1921	1922	1923	1924	1925	1926	1927
January	97.6	79.4	105.1	116.1	97.8	8.2	112.4
February	109.2	100.6	113.6	129.9	120.0	10.3	105.9
March	103.8	103.8	114.1	125.1	98.5	120.0	91.3
April	92.2	25.7	100.4	117.6	92.6	115.7	93.0
May	99.9	7.8	112.9	121.0	127.9	128.0	120.1
June	108.8	8.1	114.9	109.1	117.6	131.1	126.6
July	100.9	8.3	98.8	116.5	113.7	115.5	86.3
August	97.6	8.7	106.2	118.9	124.6	123.6	90.5
September	104.2	28.1	80.7	117.8	26.9	126.2	112.0
October	109.8	103.5	124.4	117.3	8.3	134.6	109.4
November	93.0	102.4	111.0	108.5	7.8	115.0	116.2
December	106.9	111.2	122.1	103.8	8.1	127.4	98.1
Average	102.0	57.3	104.5	116.8	78.7	104.6	105.2

TRANSPORTATION AND COMMUNICATION

	1921	1922	1923	1924	1925	1926	1927
January	82.5	82.3	100.7	100.6	104.3	100.8	106.1
February	76.8	76.9	92.1	97.7	94.9	97.3	96.6
March	83.1	85.6	102.0	102.0	99.9	105.2	104.5
April	79.8	77.7	97.4	96.9	96.8	99.5	100.5
May	81.3	81.6	104.9	99.1	100.2	101.7	102.2
June	82.1	82.7	103.4	94.8	98.2	101.6	101.1
July	81.1	85.6	104.7	98.3	100.8	103.2	100.4
August	83.0	91.0	106.3	96.7	99.9	103.1	103.5
September	82.0	94.3	100.9	96.7	97.2	102.7	101.7
October	88.3	97.4	107.5	102.1	103.2	108.7	103.2
November	86.4	96.6	101.1	95.8	100.0	107.0	98.5
December	84.7	99.4	99.2	100.1	103.4	111.3	100.5
Average	82.6	87.6	101.7	98.4	99.9	103.5	101.6

CONSTRUCTION

	1926	1927
January	101.0	84.0
February	118.0	72.7
March	95.9	71.4
April	124.5	78.4
May	150.7	86.4
June	137.6	97.0
July	133.3	98.6
August	129.5	100.3
September	160.5	101.0
October	148.4	101.4
November	125.4	99.0
December	99.7	84.1
Average	127.0	89.5

METAL PRODUCTS GROUP

	1923	1924	1925	1926	1927
January	98.1	105.4	100.6	96.5	96.2
February	101.7	113.9	103.0	102.7	101.2
March	107.1	112.4	101.0	103.8	100.5
April	105.4	110.6	97.7	102.1	97.9
May	116.1	102.0	96.2	97.8	92.8
June	114.8	88.1	91.5	98.5	92.9
July	102.8	75.7	83.5	91.2	83.5
August	110.0	84.7	88.4	95.9	88.0
September	110.4	86.5	88.0	99.5	83.1
October	113.1	90.0	97.8	105.1	82.1
November	110.2	88.6	95.0	99.8	81.8
December	108.1	101.5	101.5	100.9	82.8
Average	108.1	96.6	95.3	99.5	90.2

TRANSPORTATION EQUIPMENT GROUP

	1923	1924	1925	1926	1927
January	109.6	87.8	94.9	96.8	101.9
February	108.1	87.6	91.3	95.0	97.6
March	119.0	93.9	99.1	103.6	99.9
April	116.1	92.5	95.2	102.7	93.4
May	128.9	89.0	94.8	100.9	90.6
June	128.0	85.6	95.3	99.1	88.1
July	127.3	86.9	92.9	98.3	88.9
August	126.5	83.0	88.2	98.8	85.4
September	118.1	82.9	87.8	95.1	80.0
October	123.4	91.5	93.1	101.4	80.6
November	110.6	87.1	89.8	99.5	80.1
December	104.5	94.0	96.2	103.9	81.1
Average	118.3	88.5	93.2	99.6	88.6

TEXTILE PRODUCTS GROUP

	1923	1924	1925	1926	1927
January	98.5	95.4	100.0	109.7	109.1
February	104.9	100.5	106.4	114.1	113.4
March	105.6	99.2	110.2	109.2	112.2
April	105.2	92.1	104.5	98.9	107.4
May	109.6	85.8	109.0	101.4	107.7
June	105.8	79.0	106.0	100.4	103.4
July	102.3	71.2	104.4	95.2	96.2
August	95.8	78.7	109.9	100.8	101.2
September	97.6	85.2	103.1	103.1	101.6
October	103.7	95.7	112.9	114.3	110.8
November	97.2	98.1	113.0	114.0	113.4
December	98.0	103.3	111.2	115.6	114.0
Average	102.0	90.4	107.6	106.4	107.5

FOODS AND TOBACCO GROUP

	1923	1924	1925	1926	1927
January	101.3	95.8	97.4	95.0	98.9
February	103.5	101.4	98.0	97.4	100.8
March	105.3	98.6	98.4	99.4	100.8
April	100.9	97.8	94.1	96.6	86.5
May	103.7	100.7	99.8	97.0	99.1
June	103.1	99.9	101.1	100.5	103.6
July	101.8	97.9	97.9	98.6	100.1
August	93.3	99.5	97.6	98.3	100.4
September	98.9	104.5	96.8	99.9	99.4
October	106.0	104.7	101.8	106.3	101.6
November	103.7	97.5	99.7	103.7	98.6
December	101.2	97.9	98.9	104.9	94.8
Average	101.9	99.7	98.5	99.8	98.7

STONE, CLAY AND GLASS PRODUCTS GROUP

	1923	1924	1925	1926	1927
January	92.7	96.7	92.1	95.5	89.0
February	93.2	103.3	98.3	99.6	95.6
March	101.8	106.4	96.6	102.4	99.5
April	104.0	106.8	98.9	101.8	102.2
May	108.6	104.4	98.1	103.7	97.9
June	109.1	96.8	97.1	106.5	98.5
July	103.0	87.9	95.7	97.3	89.1
August	104.6	94.7	98.3	99.0	93.1
September	102.6	95.3	97.5	103.4	94.5
October	106.3	99.2	102.5	108.6	94.8
November	104.7	101.3	97.6	104.0	90.1
December	102.4	99.9	100.3	99.3	79.0
Average	102.8	99.4	97.8	101.8	93.6

LUMBER PRODUCTS GROUP

	1923	1924	1925	1926	1927
January	86.3	97.5	98.6	95.4	83.0
February	86.8	103.1	104.2	96.6	82.4
March	94.0	101.3	96.4	96.8	81.3
April	94.1	96.1	89.7	91.9	83.3
May	97.2	91.3	90.7	85.6	82.4
June	106.4	88.0	98.2	89.0	87.9
July	102.1	91.8	105.9	90.9	88.6
August	103.6	98.2	103.3	92.7	92.8
September	104.8	97.6	106.1	96.7	95.0
October	103.7	98.6	115.6	101.6	93.9
November	101.6	104.3	115.1	101.3	84.0
December	104.2	111.9	112.6	94.3	82.3
Average	98.7	98.3	103.0	94.4	86.4

Chemical Products Group

	1923	1924	1925	1926	1927
January	88.3	96.6	95.8	103.9	112.3
February	90.9	103.5	99.9	112.6	116.6
March	93.2	102.5	101.4	114.4	118.6
April	92.5	102.0	100.8	115.8	119.8
May	108.4	98.9	100.3	111.0	111.2
June	105.9	94.3	99.0	113.0	102.5
July	106.1	93.0	100.5	111.6	100.0
August	103.3	92.8	103.4	111.1	101.6
September	100.0	93.5	107.6	112.3	100.0
October	104.6	98.2	107.7	116.3	103.9
November	102.0	98.8	105.6	117.6	104.1
December	99.9	102.0	107.4	118.3	103.0
Average	99.6	98.0	102.5	113.2	107.8

Leather and Rubber Products Group

	1923	1924	1925	1926	1927
January	109.1	102.6	96.9	101.1	100.5
February	111.6	106.8	102.9	106.4	105.4
March	114.4	101.3	103.5	104.4	105.9
April	110.1	97.8	94.9	101.0	103.5
May	112.3	93.4	97.4	101.8	100.0
June	113.7	88.4	91.5	99.2	97.0
July	105.7	83.7	91.1	92.7	98.3
August	98.3	90.4	99.0	98.9	104.1
September	103.3	93.9	95.1	102.2	105.3
October	107.6	97.2	102.1	100.8	106.8
November	98.1	92.0	98.1	96.0	102.9
December	101.0	95.1	100.1	101.7	103.9
Average	107.1	95.2	97.7	100.5	102.8

Paper and Printing Group

	1923	1924	1925	1926	1927
January	92.7	96.1	102.6	103.3	103.6
February	93.6	101.2	100.2	104.3	104.2
March	97.3	102.8	102.9	106.4	106.7
April	100.6	103.3	104.9	107.2	105.8
May	106.6	100.6	102.4	104.6	105.4
June	104.9	99.0	96.6	103.6	105.4
July	99.7	92.7	101.3	102.3	101.5
August	92.8	93.0	100.0	104.5	103.4
September	94.1	96.5	100.0	104.2	103.8
October	96.8	102.0	105.6	107.2	104.6
November	100.3	102.5	104.2	106.2	106.3
December	97.3	104.7	106.6	109.3	110.2
Average	98.1	99.5	102.3	105.3	105.1

Blast Furnaces

	1923	1924	1925	1926	1927
January	102.0	113.2	97.2	77.3	77.0
February	104.2	125.0	97.9	75.2	83.5
March	108.5	122.1	93.1	77.5	83.5
April	114.4	120.9	90.5	73.5	80.5
May	128.4	114.2	83.8	71.8	76.4
June	128.6	106.8	76.1	73.7	77.2
July	125.7	99.8	69.7	70.7	72.3
August	120.6	94.5	68.1	71.1	68.0
September	120.1	90.1	62.3	75.0	58.3
October	123.4	90.5	61.3	79.7	57.6
November	122.4	90.3	57.0	80.1	50.9
December	120.8	94.8	61.6	77.3	54.7
Average	118.3	105.2	76.6	75.1	70.0

Steel Works and Rolling Mills

	1923	1924	1925	1926	1927
January	98.3	111.5	104.2	94.5	92.9
February	100.3	120.5	105.1	101.4	98.0
March	105.9	118.3	103.1	102.7	98.2
April	101.4	115.5	99.7	100.7	97.0
May	114.5	103.9	95.7	95.8	90.1
June	112.0	86.1	88.9	96.9	88.0
July	95.6	72.8	79.9	86.8	75.9
August	107.6	85.2	83.7	91.2	81.2
September	110.2	88.0	85.3	94.9	77.8
October	114.4	89.9	94.2	98.5	77.8
November	113.9	89.1	90.9	91.5	78.2
December	111.3	103.8	99.4	95.4	77.3
Average	107.1	98.7	94.2	95.9	86.0

Iron and Steel Forgings

	1923	1924	1925	1926	1927
January	95.8	102.5	103.6	110.0	102.1
February	99.2	104.6	109.4	117.3	102.9
March	101.7	107.6	104.3	143.3	102.4
April	105.0	110.6	102.0	142.1	100.3
May	114.6	95.0	105.7	109.1	98.8
June	117.8	80.9	101.9	95.4	90.6
July	111.3	74.0	91.8	83.2	81.6
August	107.0	80.8	90.0	91.9	87.2
September	94.7	83.3	90.6	89.5	75.8
October	102.3	93.2	103.0	99.3	77.3
November	96.5	96.5	108.8	93.4	88.2
December	94.8	102.6	116.7	96.7	91.1
Average	103.4	94.3	102.3	105.9	91.5

STRUCTURAL IRON WORK

	1923	1924	1925	1926	1927
January	87.7	85.9	89.8	92.1	87.5
February	97.0	98.7	90.1	99.4	95.2
March	100.0	101.7	90.8	98.9	91.6
April	102.9	101.7	93.1	100.5	94.2
May	112.7	103.6	94.1	101.3	97.0
June	114.0	99.7	95.2	99.8	98.8
July	115.8	91.6	86.0	102.4	95.9
August	120.5	101.9	97.7	110.7	103.8
September	121.2	102.7	92.7	105.8	88.2
October	117.4	94.2	102.1	110.1	99.8
November	114.9	87.5	99.8	101.4	93.5
December	102.6	90.5	101.3	101.2	97.8
Average	108.9	96.6	94.4	102.0	95.3

STEAM AND HOT WATER HEATING APPARATUS

	1923	1924	1925	1926	1927
January	78.3	85.2	87.2	112.6	101.6
February	94.6	93.4	100.7	118.0	106.9
March	109.0	98.3	98.5	116.4	107.9
April	110.9	100.7	99.1	116.1	103.5
May	123.9	102.1	101.7	114.4	98.8
June	118.8	100.2	103.1	106.8	102.0
July	101.1	86.9	94.2	101.0	98.1
August	115.2	95.1	101.9	106.0	99.9
September	105.7	92.0	98.7	112.8	91.7
October	110.3	91.6	112.4	118.1	86.9
November	102.5	78.9	105.3	106.9	83.7
December	91.7	94.5	115.6	102.7	88.5
Average	105.2	93.2	101.5	111.0	97.5

STOVES AND FURNACES

	1923	1924	1925	1926	1927
January	72.2	103.5	66.2	78.0	81.6
February	101.1	114.3	110.5	97.5	104.9
March	95.0	115.9	107.8	103.5	109.9
April	102.2	115.6	98.4	106.5	100.9
May	92.1	113.4	100.3	104.0	93.2
June	92.0	114.9	88.6	103.7	89.8
July	73.8	50.0	52.2	75.4	57.2
August	103.0	92.4	86.7	85.7	76.8
September	111.0	101.7	96.7	107.2	88.4
October	116.0	122.7	109.3	117.4	98.7
November	102.0	113.7	115.1	122.7	93.0
December	117.2	117.4	114.6	120.5	82.0
Average	98.1	106.3	95.5	101.9	89.7

FOUNDRIES

	1923	1924	1925	1926	1927
January	98.1	88.7	93.7	102.8	95.9
February	105.9	96.1	101.8	109.7	101.3
March	115.8	95.5	102.8	109.8	101.3
April	116.3	102.9	102.7	107.2	99.4
May	127.2	102.2	99.7	102.7	93.2
June	129.0	94.9	95.8	103.6	93.3
July	120.6	78.0	87.0	98.7	88.0
August	129.3	75.7	88.7	97.4	91.0
September	122.3	72.6	86.5	100.7	83.3
October	114.8	81.7	96.9	105.7	81.8
November	104.1	80.7	95.2	99.4	81.3
December	95.7	94.2	106.6	105.0	83.6
Average	114.9	88.6	96.5	103.6	91.1

MACHINERY AND PARTS

	1923	1924	1925	1926	1927
January	105.6	103.9	89.0	103.4	116.2
February	106.6	108.6	90.0	108.2	117.3
March	107.9	105.2	93.5	108.6	112.9
April	109.1	103.8	91.5	109.5	109.2
May	113.2	98.8	94.9	111.1	106.5
June	116.1	93.6	94.6	114.4	107.2
July	114.2	84.4	92.8	109.8	99.8
August	115.3	86.2	94.6	113.3	98.2
September	114.3	82.5	90.8	113.2	92.2
October	115.2	85.7	100.0	120.3	99.7
November	111.0	81.0	100.1	117.9	95.5
December	111.0	88.5	107.0	120.4	99.4
Average	111.6	93.5	94.9	112.5	104.5

ELECTRICAL APPARATUS

	1923	1924	1925	1926	1927
January	70.0	131.0	111.1	86.8	114.2
February	72.2	124.0	103.4	90.4	110.9
March	71.8	118.9	86.6	86.8	103.8
April	67.0	102.5	76.2	77.7	93.7
May	67.9	92.3	84.6	75.4	94.0
June	67.7	78.1	86.3	85.4	117.8
July	123.2	73.5	74.9	94.1	124.3
August	115.1	78.9	109.3	113.1	135.6
September	119.9	92.2	109.5	137.0	136.3
October	118.6	107.1	136.2	169.4	116.1
November	121.1	115.9	132.4	184.1	112.4
December	130.6	124.9	103.3	142.7	118.2
Average	95.6	103.3	101.1	111.9	114.8

ENGINES AND PUMPS

	1923	1924	1925	1926	1927
January	101.6	100.7	87.7	88.8	106.4
February	104.8	109.7	94.8	89.7	115.3
March	110.8	105.9	94.4	94.5	112.8
April	121.0	105.2	94.7	97.9	97.0
May	125.0	102.5	99.4	100.6	100.0
June	125.8	95.1	98.5	99.7	99.9
July	121.2	89.5	97.2	101.3	98.4
August	119.7	93.0	96.4	106.4	99.1
September	110.2	84.2	84.7	100.0	79.9
October	114.0	88.2	90.1	108.5	90.9
November	104.1	77.0	78.1	95.9	76.3
December	104.3	83.8	86.1	107.5	81.4
Average	113.6	94.5	91.9	99.2	96.5

HARDWARE AND TOOLS

	1923	1924	1925	1926	1927
January	94.2	93.7	100.4	104.0	91.6
February	100.2	112.1	104.1	111.7	101.7
March	108.1	111.9	102.8	110.6	99.4
April	114.2	109.8	92.5	106.2	97.4
May	116.4	99.1	97.7	101.8	94.0
June	119.1	83.3	96.0	99.9	93.5
July	117.6	69.8	93.2	93.4	77.0
August	101.6	73.3	95.7	97.7	86.3
September	108.5	79.4	93.3	97.0	84.2
October	110.9	87.9	101.7	98.1	83.9
November	101.2	88.7	102.6	95.1	80.5
December	107.1	102.6	109.5	96.4	85.5
Average	108.3	92.6	99.1	101.0	89.6

BRASS AND BRONZE PRODUCTS

	1923	1924	1925	1926	1927
January	89.7	113.0	101.0	102.9	80.8
February	90.7	87.0	104.2	98.0	83.4
March	100.7	92.5	113.2	96.3	81.6
April	107.1	90.0	106.2	99.9	83.8
May	113.2	96.6	106.7	92.9	84.3
June	116.7	91.3	105.0	100.4	86.9
July	114.8	88.6	99.1	92.1	83.8
August	111.0	84.3	97.0	92.9	82.4
September	100.8	92.6	98.3	87.0	81.3
October	105.3	84.4	103.9	91.7	84.2
November	90.3	95.3	99.6	83.7	79.2
December	104.2	99.4	107.0	81.8	76.6
Average	103.7	92.9	103.4	93.3	82.4

Automobiles

	1923	1924	1925	1926	1927
January	92.9	79.6	94.9	107.9	91.1
February	97.3	88.6	108.5	109.5	94.5
March	104.1	92.6	113.6	120.5	103.4
April	108.1	95.0	122.7	130.8	104.9
May	114.8	94.6	127.2	124.7	109.7
June	106.3	93.6	126.3	124.4	105.5
July	101.6	81.4	111.0	102.2	85.8
August	89.9	80.6	100.6	94.4	70.4
September	88.4	83.3	114.7	76.1	69.3
October	85.0	85.8	126.6	79.0	66.2
November	85.6	85.4	118.3	80.2	69.1
December	84.4	97.0	119.2	79.7	78.9
Average	96.5	88.1	115.3	102.5	87.4

Automobile Bodies and Parts

	1923	1924	1925	1926	1927
January	112.1	92.9	94.8	107.6	75.3
February	115.3	91.6	95.7	120.7	75.4
March	121.2	95.4	104.2	120.9	72.7
April	117.7	97.5	108.8	117.5	71.0
May	121.3	88.2	119.3	117.2	69.3
June	93.4	75.2	126.1	100.5	72.0
July	91.2	70.6	129.2	85.5	68.2
August	88.2	71.6	118.7	84.7	69.1
September	75.1	78.6	127.7	94.3	63.8
October	77.8	91.2	141.1	83.3	57.0
November	96.0	86.3	100.9	75.8	67.8
December	94.6	92.9	99.1	80.2	78.5
Average	100.3	86.0	113.8	99.0	69.6

Locomotives and Cars

	1923	1924	1925	1926	1927
January	130.4	65.0	68.7	85.2	93.0
February	147.3	57.3	74.0	85.3	100.0
March	157.8	60.8	83.2	86.3	94.6
April	158.9	69.6	78.1	91.7	85.8
May	172.2	72.0	73.8	91.3	75.5
June	176.8	75.9	74.7	83.3	67.4
July	180.7	75.2	71.7	87.9	72.5
August	183.8	63.7	62.8	87.7	76.4
September	174.7	57.0	65.9	84.0	69.8
October	165.5	62.0	64.9	88.1	70.1
November	150.6	65.6	68.3	82.0	67.5
December	143.9	69.3	77.4	90.2	65.5
Average	161.9	66.1	72.0	86.9	78.2

Railroad Repair Shops

	1923	1924	1925	1926	1927
January	115.2	95.8	100.9	94.1	100.6
February	103.4	96.1	93.7	90.7	90.7
March	115.1	103.0	100.7	102.2	95.6
April	108.2	96.6	95.3	96.8	88.8
May	120.5	93.8	94.5	94.1	89.3
June	119.8	88.1	94.1	95.4	89.1
July	117.5	90.8	92.9	95.2	84.5
August	116.6	88.1	89.8	96.3	87.2
September	107.3	90.6	87.1	94.6	83.6
October	118.0	100.1	92.9	100.9	86.9
November	101.4	94.9	89.2	100.6	85.0
December	93.1	99.8	94.6	104.0	85.6
Average	111.3	94.8	93.8	97.1	88.9

Shipbuilding

	1923	1924	1925	1926	1927
January	104.1	133.0	68.3	86.0	106.2
February	125.0	138.9	52.3	82.8	108.2
March	118.3	141.1	57.7	86.4	107.3
April	129.6	139.3	58.5	99.2	108.4
May	142.7	103.1	65.3	103.1	93.7
June	136.5	93.1	71.6	103.3	89.7
July	130.7	96.9	69.5	106.7	72.9
August	122.1	97.3	77.5	112.8	70.1
September	121.1	82.6	67.2	97.6	62.5
October	122.8	82.2	75.8	120.9	43.9
November	126.1	74.8	81.9	122.3	42.7
December	130.8	68.6	92.7	123.6	42.1
Average	125.8	104.2	69.9	103.7	79.0

Cotton Goods

	1923	1924	1925	1926	1927
January	108.9	99.6	100.2	103.5	96.2
February	113.6	99.6	105.0	106.1	105.6
March	118.5	99.5	109.8	106.0	102.6
April	117.1	96.8	107.3	103.7	100.1
May	111.4	85.2	106.4	96.9	93.5
June	101.2	81.4	98.2	91.0	92.7
July	96.2	72.5	97.5	78.8	87.0
August	98.9	77.2	103.6	85.7	86.6
September	102.8	86.8	88.4	87.7	93.9
October	107.5	91.4	106.0	92.4	94.3
November	95.4	92.6	106.9	99.5	97.0
December	107.5	100.6	107.6	104.0	93.7
Average	106.6	90.3	103.1	96.3	95.3

Woolens and Worsteds

	1923	1924	1925	1926	1927
January	118.8	109.9	106.6	82.0	101.3
February	126.7	114.8	102.2	79.0	103.0
March	125.8	108.0	96.1	82.1	101.1
April	121.8	89.1	82.8	68.6	94.6
May	125.6	81.5	83.3	67.3	86.8
June	118.3	70.4	78.0	71.3	86.2
July	110.9	69.0	80.9	73.5	86.5
August	104.6	76.8	86.0	81.1	97.2
September	106.7	91.6	81.9	83.8	101.5
October	115.7	109.0	90.2	98.0	107.8
November	112.2	109.0	86.7	99.4	105.4
December	109.9	113.0	85.7	98.3	98.8
Average	116.4	95.2	88.4	82.0	97.5

Silk Goods

	1923	1924	1925	1926	1927
January	91.2	85.0	96.9	127.6	106.7
February	98.3	89.3	107.9	131.3	111.0
March	97.2	87.9	112.7	116.6	109.9
April	97.7	81.9	114.1	102.9	107.7
May	102.3	77.4	122.0	101.1	103.9
June	98.7	74.2	120.1	99.9	96.2
July	96.2	70.8	120.7	95.4	89.5
August	93.1	81.1	125.8	109.1	101.3
September	94.4	84.4	122.7	109.6	98.2
October	96.4	95.5	132.6	125.3	103.9
November	86.7	95.7	134.4	121.0	113.2
December	82.1	97.7	135.7	119.9	119.5
Average	94.5	85.1	120.5	113.3	105.1

Textile Dyeing and Finishing

	1923	1924	1925	1926	1927
January	90.9	94.3	112.9	120.6	138.7
February	97.1	106.6	118.0	127.1	145.6
March	98.1	107.6	119.2	131.9	141.6
April	97.6	82.7	98.7	122.7	134.3
May	99.6	82.9	104.8	119.4	129.6
June	102.4	72.0	99.9	119.7	124.0
July	99.6	67.3	102.4	114.6	116.7
August	99.5	84.3	109.0	118.6	121.1
September	92.2	90.1	105.1	128.6	111.4
October	92.5	96.6	128.1	140.3	124.6
November	91.0	103.4	119.9	139.1	126.2
December	94.7	111.9	126.2	136.6	127.6
Average	96.3	91.6	112.9	126.6	128.5

Carpets and Rugs

	1923	1924	1925	1926	1927
January	101.8	101.2	104.8	100.2	89.4
February	109.7	112.3	114.7	98.9	103.6
March	110.3	109.5	118.2	96.9	99.5
April	109.5	105.0	105.9	95.0	97.1
May	120.2	86.4	109.1	94.8	100.7
June	112.8	60.0	104.5	90.8	92.8
July	104.9	48.2	88.3	78.0	84.8
August	100.5	66.0	92.6	82.1	78.6
September	99.2	81.6	75.7	85.1	75.0
October	114.3	101.0	87.9	95.9	95.2
November	106.5	108.0	98.1	103.5	107.3
December	114.4	111.5	105.2	106.4	111.2
Average	108.7	90.9	100.4	94.0	94.6

Hats

	1923	1924	1925	1926	1927
January	113.3	96.1	90.6	90.5	101.6
February	120.1	103.7	93.8	100.3	107.4
March	112.6	98.2	103.8	95.1	106.0
April	108.9	89.6	89.8	73.1	88.3
May	120.0	86.5	89.9	92.7	97.5
June	124.9	87.0	103.5	102.2	106.0
July	123.8	81.8	103.6	103.1	103.9
August	105.7	98.4	104.8	106.1	102.7
September	99.1	85.7	101.5	101.4	101.7
October	107.0	85.4	92.9	107.9	101.5
November	112.4	84.0	92.3	107.0	104.5
December	107.8	86.0	96.2	104.3	101.9
Average	113.0	90.2	96.9	98.6	101.9

Hosiery

	1923	1924	1925	1926	1927
January	81.8	92.0	105.2	124.4	136.8
February	83.6	97.6	113.1	132.9	139.8
March	88.2	101.5	119.1	132.4	140.9
April	94.0	102.5	116.8	125.7	138.2
May	96.6	97.9	124.4	134.7	148.8
June	92.9	90.8	116.4	126.6	136.4
July	93.4	78.4	109.9	118.9	116.6
August	82.2	73.8	118.6	120.8	120.7
September	90.2	84.0	109.1	125.7	124.8
October	96.0	92.0	125.6	135.4	146.8
November	88.9	102.0	122.5	131.6	145.3
December	100.7	113.7	103.7	137.3	143.9
Average	90.7	93.9	115.4	128.8	136.6

Knit Goods, Other

	1923	1924	1925	1926	1927
January	104.9	97.2	92.7	83.0	69.6
February	114.3	107.9	102.4	97.3	75.9
March	117.0	108.5	103.0	93.6	74.4
April	113.5	100.3	105.3	88.2	74.4
May	117.2	97.5	101.0	89.3	78.1
June	112.1	90.0	95.3	89.1	75.3
July	103.4	72.3	93.8	81.4	75.4
August	106.4	74.5	97.5	70.1	70.9
September	105.0	80.1	86.0	76.0	73.9
October	110.3	93.9	97.0	86.3	87.4
November	103.0	103.2	94.3	93.6	89.4
December	100.4	100.9	92.5	94.1	89.2
Average	109.0	94.3	96.7	86.8	77.8

Men's Clothing

	1923	1924	1925	1926	1927
January	94.9	107.0	96.3	117.1	127.1
February	100.7	86.5	103.3	113.0	124.6
March	109.5	88.3	105.0	98.2	119.0
April	99.9	77.7	86.7	83.4	110.0
May	120.5	83.6	108.9	93.2	103.9
June	128.4	99.9	110.5	113.7	117.6
July	116.4	84.1	109.1	114.3	111.8
August	102.0	91.4	116.0	106.9	126.4
September	98.9	95.4	109.7	122.8	119.6
October	100.9	95.3	106.1	113.3	109.7
November	84.6	67.3	105.7	106.6	91.5
December	105.1	87.8	115.9	118.6	90.3
Average	105.2	88.7	106.1	108.4	112.6

Women's Clothing

	1923	1924	1925	1926	1927
January	107.7	105.4	82.2	110.8	118.0
February	116.6	105.0	109.4	116.5	135.1
March	109.7	100.7	118.6	112.1	129.6
April	121.7	113.5	109.2	113.6	126.8
May	118.7	107.9	102.3	112.3	115.3
June	107.2	91.9	98.5	108.0	107.6
July	108.4	79.4	85.1	103.1	109.9
August	107.9	74.3	97.7	112.7	97.2
September	92.0	74.2	88.3	100.8	108.3
October	101.6	67.2	104.2	103.6	104.0
November	103.1	91.1	101.9	103.2	115.7
December	100.7	96.5	100.7	117.9	126.4
Average	107.9	92.3	99.8	109.6	116.2

Shirts and Furnishings

	1923	1924	1925	1926	1927
January	89.6	105.9	84.8	108.2	98.6
February	102.4	108.0	88.6	117.9	88.8
March	109.8	109.2	97.7	114.1	96.8
April	109.5	105.0	100.3	107.2	89.8
May	102.3	93.9	107.1	103.3	94.3
June	105.0	79.8	101.1	89.1	90.1
July	110.2	66.6	99.1	83.0	88.6
August	88.1	71.3	105.2	81.8	89.1
September	113.2	81.2	107.1	91.0	86.5
October	124.7	85.8	109.1	105.4	103.1
November	115.8	81.0	118.2	109.7	99.6
December	116.6	86.0	120.6	111.0	100.7
Average	107.3	89.5	103.2	101.8	93.8

Bread and Bakery Products

	1923	1924	1925	1926	1927
January	87.5	102.3	102.2	99.2	105.0
February	88.3	102.3	101.2	99.5	105.4
March	91.7	102.6	100.9	99.8	107.5
April	90.8	102.4	102.5	98.7	107.0
May	95.3	106.4	108.3	102.4	110.2
June	96.5	103.7	105.8	104.4	112.6
July	96.9	101.3	100.0	102.5	107.1
August	91.6	100.9	95.4	99.8	105.4
September	106.1	99.9	94.6	101.3	103.2
October	105.9	101.8	100.3	105.7	105.6
November	105.4	101.7	99.3	107.4	104.9
December	106.7	100.9	100.2	109.0	105.0
Average	96.9	102.2	100.9	102.5	106.6

Confectionery

	1923	1924	1925	1926	1927
January	101.4	99.5	101.9	100.5	107.8
February	104.5	105.9	112.4	109.5	110.4
March	106.0	100.2	100.0	113.8	97.8
April	91.9	94.7	93.0	103.3	91.9
May	92.2	92.7	94.5	100.5	95.0
June	87.0	91.9	94.6	101.7	104.7
July	84.3	89.5	95.6	98.6	93.9
August	79.3	98.9	93.8	97.2	96.8
September	93.5	114.1	100.1	106.8	108.3
October	111.0	127.9	109.9	120.5	115.6
November	112.5	108.0	103.4	112.1	108.3
December	104.4	107.8	101.6	113.3	108.5
Average	97.3	102.6	100.1	106.5	103.3

Ice Cream

	1923	1924	1925	1926	1927
January	90.7	87.4	80.7	88.6	82.0
February	85.0	86.9	82.2	87.9	83.7
March	84.7	89.5	86.8	91.0	91.2
April	86.8	100.5	90.3	101.1	95.7
May	102.0	102.0	97.7	112.7	103.3
June	119.2	106.6	129.9	123.8	104.9
July	139.6	121.0	126.7	124.6	113.5
August	115.3	123.4	115.3	130.3	95.4
September	109.0	108.1	111.7	113.5	101.4
October	94.4	94.7	99.7	100.6	91.0
November	89.6	85.0	93.0	85.1	86.3
December	94.2	78.9	92.4	82.9	83.2
Average	100.9	98.7	100.5	103.5	94.3

Meat Packing

	1923	1924	1925	1926	1927
January	109.1	111.2	103.2	97.5	98.2
February	106.2	107.5	94.0	95.2	94.1
March	102.8	103.9	88.6	92.1	92.7
April	103.3	104.8	84.6	87.4	90.7
May	105.0	102.8	89.1	92.4	95.9
June	103.8	100.6	88.4	95.3	96.4
July	105.2	96.9	87.0	92.8	94.5
August	101.1	93.1	86.1	91.1	93.9
September	106.8	98.9	87.4	93.3	95.1
October	109.0	100.5	97.9	100.6	97.1
November	110.4	100.9	98.1	101.4	100.5
December	113.8	101.3	97.4	102.7	99.7
Average	106.4	101.8	91.8	95.2	95.7

Cigars and Tobacco

	1923	1924	1925	1926	1927
January	112.7	109.0	98.1	91.6	98.0
February	116.3	103.2	94.1	92.0	98.9
March	111.7	95.5	97.3	94.6	100.8
April	106.2	92.5	85.2	93.5	65.7
May	100.4	89.9	93.2	88.9	94.7
June	101.9	91.8	89.4	94.0	100.1
July	96.5	84.5	87.2	93.5	99.3
August	92.9	89.5	100.6	96.4	102.5
September	105.1	97.7	99.7	98.1	100.2
October	111.6	96.5	104.6	103.9	105.3
November	111.4	99.3	106.1	105.8	104.2
December	120.8	103.7	104.7	108.3	91.6
Average	107.3	96.1	96.7	96.7	96.8

BRICK, TILE AND POTTERY

	1923	1924	1925	1926	1927
January	95.2	105.3	102.5	94.1	95.3
February	96.3	107.3	105.5	96.6	99.2
March	97.7	110.7	103.5	96.1	104.3
April	98.9	111.9	99.3	100.1	109.9
May	107.3	103.1	96.4	100.3	99.4
June	109.7	97.1	93.5	101.8	101.9
July	99.1	87.0	89.5	99.5	97.7
August	111.0	94.3	93.3	99.8	95.7
September	106.4	94.1	91.9	102.8	93.5
October	105.7	99.4	97.7	108.0	91.8
November	103.5	96.0	93.9	107.1	87.0
December	101.2	97.1	98.0	103.1	82.7
Average	102.7	100.3	97.1	100.8	96.5

CEMENT

	1923	1924	1925	1926	1927
January	80.1	86.1	86.3	104.5	105.1
February	78.4	95.8	94.0	108.7	105.8
March	90.5	95.0	93.3	114.0	109.1
April	98.6	98.9	99.9	116.1	114.1
May	104.4	101.1	103.4	120.4	114.3
June	101.3	100.0	104.9	124.9	120.7
July	101.5	102.0	113.4	117.2	114.0
August	97.9	105.4	116.2	119.7	114.5
September	96.4	103.0	114.7	120.3	112.2
October	100.3	105.7	116.1	122.9	108.2
November	98.8	102.3	109.3	119.4	103.6
December	94.6	98.5	109.7	113.6	96.1
Average	95.2	99.5	105.1	116.8	109.8

GLASS

	1923	1924	1925	1926	1927
January	98.8	101.0	91.6	91.5	74.9
February	102.6	108.4	98.9	96.7	87.9
March	111.0	111.6	96.8	99.3	92.0
April	106.7	108.9	99.5	94.0	91.4
May	109.1	105.7	96.5	94.7	86.4
June	114.0	91.7	95.0	96.9	81.0
July	101.8	74.2	87.3	82.6	66.4
August	105.4	84.1	90.1	84.4	76.5
September	104.5	88.1	90.6	92.8	83.0
October	111.2	92.6	98.9	100.3	88.3
November	110.7	102.4	95.4	92.6	83.1
December	111.0	102.4	100.1	88.4	64.8
Average	107.2	97.6	95.1	92.9	81.3

Lumber and Planing Mills

	1923	1924	1925	1926	1927
January	78.0	94.3	90.0	99.3	80.2
February	76.0	103.1	101.3	102.6	82.8
March	86.2	97.6	96.0	98.0	78.7
April	87.3	93.4	100.4	94.7	86.4
May	95.8	88.0	97.9	91.2	81.0
June	105.7	96.4	114.5	91.1	83.1
July	104.2	111.9	124.4	93.3	85.5
August	106.8	111.1	109.4	91.2	82.9
September	102.5	97.5	108.2	89.9	82.3
October	97.8	93.9	111.9	91.1	81.9
November	102.4	102.7	108.8	89.2	81.9
December	100.7	100.0	105.0	85.8	75.9
Average	95.3	99.2	105.6	93.1	81.9

Furniture

	1923	1924	1925	1926	1927
January	92.4	102.2	108.0	89.4	82.1
February	93.9	104.4	109.2	88.5	77.4
March	98.9	104.8	96.9	93.0	78.8
April	99.2	98.7	82.3	87.6	76.8
May	97.6	92.5	86.0	77.8	81.0
June	107.3	78.9	86.3	82.2	89.2
July	100.0	72.4	91.2	84.2	87.7
August	96.4	85.6	99.4	89.4	97.5
September	104.9	96.6	104.8	100.5	101.7
October	103.8	101.2	121.1	109.2	99.3
November	102.0	107.0	122.2	110.6	79.4
December	107.8	124.8	120.9	99.6	86.8
Average	100.3	97.4	102.4	92.7	86.5

Wooden Boxes

	1923	1924	1925	1926	1927
January	83.4	84.0	93.9	111.9	111.1
February	94.3	94.9	94.5	112.0	114.5
March	98.2	102.6	100.0	117.7	116.7
April	91.2	97.2	77.7	104.8	105.3
May	95.4	103.4	83.5	103.0	103.9
June	96.5	95.7	83.4	121.8	116.4
July	97.8	94.4	87.8	121.6	117.7
August	127.8	102.4	94.4	126.3	134.8
September	116.5	106.2	107.5	124.7	142.9
October	135.5	111.5	113.0	127.7	143.4
November	92.6	99.4	119.0	126.4	126.7
December	99.5	104.8	118.9	120.2	104.7
Average	102.4	99.7	97.8	118.2	119.8

Chemicals and Drugs

	1923	1924	1925	1926	1927
January	121.4	108.8	92.1	100.5	91.3
February	110.4	105.7	95.4	99.1	93.5
March	118.4	107.5	102.8	106.3	93.3
April	107.7	102.8	96.3	101.6	91.1
May	111.7	98.0	96.1	97.3	88.7
June	110.4	93.7	90.2	93.5	88.2
July	107.4	84.0	91.1	88.9	84.8
August	98.8	85.4	91.5	86.5	89.3
September	101.7	85.2	93.1	88.0	90.1
October	107.1	82.7	96.4	93.0	91.1
November	110.8	87.3	99.2	91.0	92.6
December	111.9	96.3	100.6	92.8	91.2
Average	109.8	94.8	95.4	94.9	90.4

Coke

	1923	1924	1925	1926	1927
January	83.0	102.2	108.8	99.3	116.6
February	86.4	105.1	108.0	101.1	114.5
March	89.3	104.1	107.5	100.0	113.7
April	82.6	98.3	107.0	95.7	116.9
May	98.1	92.8	104.7	96.5	101.1
June	100.7	88.6	100.4	101.4	92.7
July	90.2	105.7	93.8	99.5	101.2
August	95.7	104.4	97.2	98.8	105.4
September	99.7	108.0	101.4	105.7	106.5
October	102.2	112.9	100.8	109.9	114.8
November	99.0	116.4	91.2	118.8	116.9
December	99.9	114.2	99.3	121.4	120.6
Average	93.9	104.4	101.7	104.0	110.1

Explosives

	1923	1924	1925	1926	1927
January	117.1	103.4	90.8	88.4	122.4
February	108.7	97.9	89.8	90.6	127.1
March	118.5	100.7	99.8	66.2	112.3
April	112.2	95.1	96.2	99.4	127.8
May	117.1	90.8	89.4	93.6	120.5
June	111.7	91.5	94.6	93.2	128.4
July	110.6	86.7	90.3	93.0	102.2
August	116.2	92.7	96.9	104.2	105.9
September	107.2	92.3	92.6	115.1	111.5
October	120.9	102.7	90.7	99.7	121.1
November	109.4	84.7	88.7	126.3	124.9
December	101.4	98.2	92.6	129.1	111.4
Average	112.6	94.7	92.7	99.9	118.0

PAINTS AND VARNISHES

	1923	1924	1925	1926	1927
January	90.9	94.4	105.9	126.8	130.3
February	97.7	106.8	106.8	138.5	133.1
March	88.4	99.9	102.8	138.5	140.1
April	94.7	107.4	100.0	140.0	147.7
May	96.9	110.6	104.5	142.8	142.3
June	99.9	106.8	103.6	152.1	127.2
July	89.9	96.5	107.9	145.1	130.0
August	76.8	100.2	120.2	144.4	140.1
September	66.6	93.7	107.9	139.6	129.0
October	82.2	101.9	111.0	146.5	145.2
November	91.2	99.2	114.1	134.4	144.6
December	96.0	104.8	121.1	139.3	141.8
Average	89.3	101.9	108.8	140.7	137.6

PETROLEUM REFINING

	1923	1924	1925	1926	1927
January	81.4	92.3	92.2	103.7	111.7
February	86.2	102.8	98.9	117.6	119.0
March	88.1	102.0	99.7	121.7	123.2
April	91.3	103.8	100.1	124.1	122.8
May	111.6	101.5	100.0	116.3	115.0
June	106.9	96.2	99.7	117.8	104.0
July	113.1	90.8	104.1	118.0	98.4
August	108.5	89.7	105.6	117.1	97.0
September	102.8	90.3	112.8	116.1	94.4
October	106.1	95.6	111.7	120.8	95.3
November	102.2	96.3	108.2	119.7	94.3
December	98.3	99.6	108.7	118.7	92.7
Average	99.7	96.7	103.5	117.6	105.7

LEATHER TANNING

	1923	1924	1925	1926	1927
January	113.6	107.8	89.3	102.5	107.6
February	112.1	106.7	93.9	107.1	107.7
March	115.7	99.5	93.8	105.5	106.2
April	116.6	94.5	85.0	105.5	105.4
May	122.5	92.6	91.1	106.5	103.1
June	123.9	86.8	92.1	101.9	103.7
July	113.8	78.4	88.9	93.2	102.3
August	105.5	83.7	93.8	97.2	103.2
September	111.7	85.4	95.2	102.1	108.4
October	114.2	89.3	103.0	99.0	112.8
November	106.9	89.1	103.0	97.7	111.5
December	106.9	92.3	101.8	107.0	109.1
Average	113.6	92.2	94.2	102.1	106.8

Shoes

	1923	1924	1925	1926	1927
January	108.2	95.6	100.2	98.2	87.7
February	111.5	109.0	110.4	105.4	98.4
March	113.4	107.1	111.9	101.2	100.4
April	106.6	106.4	101.5	93.2	93.1
May	107.2	95.2	95.9	90.0	88.4
June	106.3	86.0	85.3	88.7	78.6
July	107.1	87.0	88.3	82.9	88.6
August	102.1	96.0	101.0	95.8	103.5
September	103.7	101.4	90.9	96.3	100.0
October	106.3	102.2	96.2	95.9	100.7
November	93.5	96.3	86.5	86.2	90.7
December	94.3	97.3	90.8	90.2	91.4
Average	105.1	98.3	96.6	93.7	93.5

Leather Products, Other

	1923	1924	1925	1926	1927
January	87.5	112.8	104.3	102.1	109.0
February	96.9	115.9	95.8	106.2	119.3
March	108.2	115.8	96.9	107.3	124.9
April	100.3	109.4	94.8	105.8	116.8
May	97.0	90.9	97.6	103.1	105.1
June	96.7	83.9	100.4	103.4	102.6
July	90.7	85.3	96.8	100.7	101.6
August	95.1	84.7	101.6	102.3	111.2
September	95.6	87.3	102.6	109.9	112.6
October	110.6	99.4	101.0	123.0	84.9
November	119.2	97.3	110.2	127.6	116.2
December	114.3	94.7	108.5	120.4	122.0
Average	101.0	98.1	100.9	109.3	110.6

Rubber Tires and Goods

	1923	1924	1925	1926	1927
January	100.4	96.6	124.2	101.3	99.2
February	120.3	93.9	127.3	103.7	108.2
March	118.4	83.3	129.7	105.4	112.4
April	93.7	77.2	126.3	97.4	120.6
May	80.8	90.8	136.6	111.3	118.0
June	91.9	109.2	104.7	113.9	117.9
July	60.7	102.6	109.3	115.1	106.7
August	44.1	110.5	120.0	115.1	107.7
September	56.3	117.3	105.3	115.4	101.4
October	73.8	121.3	117.2	113.4	104.8
November	57.9	87.9	103.0	101.1	89.7
December	89.3	100.7	117.0	98.6	107.8
Average	82.3	99.3	118.4	107.6	107.9

Paper and Wood Pulp

	1923	1924	1925	1926	1927
January	92.9	93.0	103.8	101.0	96.0
February	92.6	99.8	100.0	101.5	98.4
March	95.3	103.1	101.4	105.2	100.6
April	102.4	103.3	104.4	106.0	99.3
May	113.3	99.1	102.2	102.2	99.5
June	113.5	96.9	96.1	101.9	98.6
July	104.2	89.7	99.6	98.4	94.6
August	101.3	93.5	102.0	102.6	98.8
September	96.9	95.0	99.9	101.8	98.1
October	97.9	101.9	104.6	103.3	96.0
November	99.0	102.2	99.7	98.9	95.5
December	92.6	103.0	102.9	101.6	105.3
Average	100.2	98.4	101.4	102.0	98.4

Paper Boxes and Bags

	1923	1924	1925	1926	1927
January	90.8	90.5	104.7	109.3	111.2
February	102.3	90.8	100.0	103.9	116.8
March	103.8	95.4	100.0	110.4	104.4
April	102.7	91.2	98.0	99.6	108.7
May	102.2	90.8	94.3	103.7	107.1
June	103.8	87.9	79.0	97.6	109.3
July	103.5	75.1	103.6	91.7	97.6
August	91.8	91.0	100.6	100.5	111.1
September	90.6	96.0	98.1	103.2	110.2
October	104.6	107.7	115.8	117.8	127.5
November	113.8	111.6	116.4	119.9	132.5
December	114.4	116.9	119.8	120.5	126.4
Average	102.0	95.4	102.5	106.5	113.6

Printing and Publishing

	1923	1924	1925	1926	1927
January	90.6	99.2	102.5	105.6	110.8
February	92.3	102.9	101.5	107.8	109.5
March	97.0	103.1	105.5	108.1	113.5
April	97.5	104.1	107.1	109.8	112.4
May	99.1	103.0	104.0	107.7	111.5
June	95.9	102.2	99.5	106.4	112.3
July	94.1	97.4	103.5	107.7	109.0
August	83.7	93.5	98.9	107.6	107.8
September	90.7	98.9	100.8	107.5	109.3
October	94.8	102.8	106.4	110.9	111.6
November	100.5	103.1	107.8	112.8	114.9
December	100.4	106.9	109.7	116.2	114.0
Average	94.7	101.4	103.9	109.0	111.4

CITY INDEX NUMBERS

These series for city areas have not been computed by the methods described in Chapter III, but are chain indexes constructed by "linking" together monthly percentage changes.

	Employment	*Wage payments*
	PAGE	PAGE
Allentown	184	189
Erie	184	189
Harrisburg	184	189
Hazleton-Pottsville	185	190
Johnstown	185	190
Lancaster	185	190
New Castle	186	191
Philadelphia	183	188
Pittsburgh	183	188
Reading	183	188
Scranton	186	191
Sunbury	186	191
Wilkes-Barre	187	192
Williamsport	187	192
York	187	192

PHILADELPHIA

	1921	1922	1923	1924	1925	1926	1927
January	95.6	87.2	103.5	97.5	94.6	102.1	102.9
February	91.8	86.2	107.6	97.1	92.0	103.5	103.7
March	90.1	86.8	109.5	96.5	93.5	103.7	103.8
April	88.8	89.6	110.4	94.4	92.7	102.6	100.1
May	89.8	87.4	112.3	91.5	93.7	101.7	98.6
June	88.8	90.6	113.3	86.5	94.9	100.0	96.2
July	88.8	91.8	114.0	86.7	95.7	101.1	95.2
August	88.0	92.1	110.3	88.1	99.1	103.5	96.5
September	87.8	95.0	109.2	91.1	103.0	106.6	98.1
October	88.8	98.8	109.3	95.6	104.2	108.7	97.8
November	89.9	98.4	108.2	94.3	103.8	108.8	96.2
December	95.0	105.2	104.7	95.6	105.0	106.1	93.7
Average	90.3	92.4	109.4	92.9	97.7	104.1	98.6

PITTSBURGH

	1921	1922	1923	1924	1925	1926	1927
January	111.6	75.0	103.4	106.1	100.3	93.9	88.5
February	103.1	76.1	105.0	108.7	100.4	94.2	89.4
March	90.5	80.8	106.3	108.7	99.1	95.2	89.8
April	76.8	85.0	105.3	109.9	97.6	95.1	88.5
May	75.8	87.2	106.7	104.6	94.1	94.3	87.2
June	71.9	89.0	107.3	99.2	91.4	93.7	86.7
July	67.8	84.8	104.3	94.8	88.5	91.8	84.0
August	65.5	76.5	106.5	94.4	85.9	92.1	80.9
September	69.6	87.9	110.5	93.6	87.4	93.7	80.9
October	75.2	91.5	111.3	94.9	88.4	93.5	79.3
November	76.6	93.9	109.4	95.2	87.6	92.0	77.9
December	74.9	95.7	106.3	97.5	89.8	89.8	76.0
Average	79.9	85.3	106.9	100.6	92.5	93.3	84.1

READING

	1921	1922	1923	1924	1925	1926	1927
January	103.9	105.7	109.8	95.4	100.1	92.4	108.5
February	101.4	107.5	111.6	102.5	104.3	106.0	109.2
March	92.7	106.7	113.5	105.4	103.9	106.7	106.7
April	95.0	103.9	107.5	103.0	100.8	105.2	102.4
May	95.3	103.2	107.0	95.9	99.3	104.5	101.9
June	93.2	104.1	106.6	93.6	99.0	103.3	98.8
July	91.8	103.8	98.5	77.3	89.7	102.1	95.9
August	95.2	106.1	98.4	85.5	92.8	104.8	98.1
September	97.9	106.2	106.6	89.0	98.0	107.3	97.7
October	100.0	107.9	104.5	93.0	102.0	108.4	101.0
November	103.0	108.1	99.6	95.2	103.9	109.8	102.3
December	104.4	108.1	99.6	101.3	105.5	109.4	101.5
Average	97.8	105.9	105.3	94.8	99.9	105.0	102.0

ALLENTOWN

	1923	1924	1925	1926	1927
January	99.5	101.2	96.8	101.3	95.0
February	100.7	103.8	99.7	104.2	92.7
March	102.8	98.9	99.1	102.8	95.2
April	98.8	97.0	98.5	102.5	93.9
May	102.9	96.9	100.6	101.6	97.3
June	102.7	95.7	102.2	103.8	97.1
July	102.4	92.9	103.1	102.4	96.8
August	102.6	95.2	103.0	102.8	98.8
September	101.8	94.9	102.8	101.8	96.7
October	103.0	96.4	104.5	101.0	96.3
November	101.5	96.9	102.3	99.8	95.5
December	100.5	96.0	102.3	97.8	93.6
Average	101.6	97.2	101.2	101.8	95.7

ERIE

	1923	1924	1925	1926	1927
January	108.2	95.9	94.2	100.5	94.3
February	101.7	99.0	95.7	102.4	95.8
March	114.1	100.6	97.9	101.8	97.0
April	110.7	100.4	98.8	100.9	98.4
May	111.3	100.9	98.6	99.5	99.8
June	107.9	94.0	98.0	99.3	101.3
July	110.1	90.4	96.9	99.3	100.4
August	110.7	90.4	95.8	99.1	98.3
September	111.7	91.7	95.7	100.5	97.8
October	106.2	89.9	97.4	100.1	97.0
November	105.2	90.5	98.4	99.1	95.1
December	98.5	93.6	98.8	96.0	94.7
Average	108.0	94.8	97.2	99.9	97.5

HARRISBURG

	1923	1924	1925	1926	1927
January	94.3	96.2	101.5	109.9	102.2
February	95.2	97.7	102.2	110.1	105.4
March	99.5	102.8	102.4	109.7	104.1
April	101.5	98.4	101.0	107.2	99.6
May	103.6	94.1	100.1	106.0	102.0
June	104.8	94.4	103.3	106.9	98.1
July	104.0	93.1	103.7	107.9	101.6
August	106.5	94.6	104.9	107.7	103.5
September	97.5	94.5	105.5	105.4	104.8
October	99.0	98.2	105.7	105.2	105.1
November	95.9	96.0	106.2	103.0	102.6
December	94.6	99.7	108.1	101.5	102.8
Average	99.7	96.6	103.7	106.7	102.7

HAZLETON—POTTSVILLE

	1923	1924	1925	1926	1927
January	103.6	101.9	98.4	104.5	97.4
February	106.1	99.5	100.8	104.2	98.2
March	110.3	97.0	98.7	104.0	97.5
April	112.0	96.2	97.3	98.9	94.3
May	110.4	89.1	98.2	96.4	97.6
June	107.6	86.1	99.2	93.8	97.0
July	106.0	83.7	99.3	96.4	95.4
August	103.4	88.5	101.9	93.0	95.1
September	103.1	92.0	103.3	97.7	95.1
October	102.3	94.2	104.1	98.4	94.5
November	99.5	95.3	105.0	100.3	93.1
December	102.4	97.2	105.5	98.5	93.5
Average	105.6	93.4	101.0	98.8	95.7

JOHNSTOWN

	1923	1924	1925	1926	1927
January	105.5	97.9	106.9	79.8	83.8
February	107.9	108.2	108.2	80.3	79.8
March	108.3	108.8	108.0	77.6	84.6
April	108.1	105.4	108.3	78.8	86.2
May	111.2	106.8	94.9	78.3	88.2
June	109.8	103.6	88.6	77.8	86.6
July	109.0	94.3	90.9	79.1	82.6
August	107.2	87.5	94.2	80.5	81.3
September	111.2	87.0	87.7	82.5	85.5
October	88.4	85.1	91.7	84.3	84.1
November	88.5	87.7	93.6	86.5	77.2
December	97.0	106.5	95.5	87.8	71.3
Average	104.3	98.2	97.4	81.1	82.6

LANCASTER

	1923	1924	1925	1926	1927
January	104.4	102.5	94.6	92.7	87.1
February	103.3	103.9	98.1	96.0	85.7
March	134.3	103.3	99.0	94.4	86.3
April	106.9	101.8	95.0	93.3	85.7
May	106.9	94.4	98.0	91.5	84.7
June	107.1	93.2	96.2	88.7	85.1
July	108.6	91.4	94.2	84.4	82.4
August	108.0	95.4	96.7	87.2	84.0
September	98.1	96.6	98.7	87.4	82.2
October	97.3	94.0	98.6	87.7	83.0
November	100.7	91.5	94.8	87.2	85.1
December	104.9	93.3	93.3	86.2	86.0
Average	106.7	96.8	96.4	89.7	84.8

NEW CASTLE

	1923	1924	1925	1926	1927
January	94.4	109.1	103.9	83.8	97.0
February	95.4	114.2	111.6	84.3	99.5
March	102.8	117.0	109.0	86.3	97.2
April	107.2	113.6	103.5	85.3	92.6
May	110.1	103.7	97.4	83.1	86.4
June	110.1	98.5	85.7	86.2	87.0
July	109.4	93.9	82.7	86.4	86.5
August	110.0	95.4	80.4	94.2	86.5
September	113.8	93.7	77.7	93.9	80.7
October	113.0	94.0	77.8	94.9	83.7
November	112.8	91.4	82.2	90.3	82.6
December	108.6	93.6	83.1	91.3	80.7
Average	107.3	101.5	91.3	88.3	88.4

SCRANTON

	1923	1924	1925	1926	1927
January	98.9	102.9	100.0	97.1	83.7
February	99.8	105.5	103.6	92.7	81.4
March	106.7	105.0	102.0	92.0	81.2
April	109.6	101.7	102.0	88.1	76.7
May	108.5	95.8	99.9	78.0	75.0
June	107.3	88.0	100.3	81.5	72.2
July	111.4	80.2	102.3	79.2	66.3
August	107.0	85.1	105.6	77.1	66.5
September	102.1	88.6	94.7	76.3	65.9
October	99.8	94.2	96.1	79.8	69.7
November	100.7	97.5	98.1	83.8	70.2
December	100.7	100.0	97.8	86.9	72.4
Average	104.4	95.4	100.2	84.4	73.4

SUNBURY

	1923	1924	1925	1926	1927
January	102.3	96.4	91.6	126.7	130.7
February	103.0	90.3	94.4	127.4	114.8
March	101.6	91.0	101.5	120.3	118.4
April	101.5	75.4	110.2	114.3	112.5
May	103.2	71.5	117.8	108.5	113.1
June	104.1	75.8	125.7	109.0	102.6
July	102.8	68.1	123.1	115.3	106.9
August	109.0	68.4	122.6	122.6	110.1
September	109.4	81.3	123.4	128.0	109.3
October	107.9	83.7	124.9	128.1	104.8
November	103.7	82.2	124.9	129.0	115.4
December	99.0	86.8	122.6	135.4	117.9
Average	104.0	80.9	115.2	122.1	113.0

WILKES-BARRE

	1923	1924	1925	1926	1927
January	100.0	91.5	97.4	122.1	115.9
February	102.7	96.6	99.0	127.2	115.1
March	105.6	95.2	101.7	124.2	113.0
April	108.0	92.2	104.5	124.2	87.4
May	100.2	86.0	106.5	114.6	108.4
June	96.3	84.4	105.0	110.5	106.7
July	99.8	88.3	111.4	113.1	105.6
August	97.2	91.5	111.6	114.7	98.6
September	93.4	90.8	112.2	114.6	106.0
October	91.9	94.7	119.7	116.5	105.2
November	91.9	97.2	124.6	115.9	107.4
December	87.8	95.5	126.5	115.9	87.6
Average	97.9	92.0	110.1	117.8	104.8

WILLIAMSPORT

	1923	1924	1925	1926	1927
January	90.7	94.0	104.2	116.6	110.0
February	92.2	92.3	105.1	115.3	113.4
March	96.9	91.4	103.1	114.2	110.9
April	96.1	88.5	107.3	118.6	110.9
May	98.1	91.2	108.6	110.7	109.2
June	94.1	104.0	122.0	117.2	106.7
July	88.3	87.3	120.0	111.7	99.4
August	90.4	94.6	117.6	113.2	104.2
September	89.2	95.6	114.2	111.1	110.1
October	86.9	94.8	118.9	110.2	103.8
November	91.7	97.9	119.2	107.8	102.9
December	93.1	103.1	117.1	108.6	105.6
Average	92.3	94.6	113.1	112.9	107.3

YORK

	1923	1924	1925	1926	1927
January	97.5	97.7	99.6	102.6	104.9
February	98.1	98.0	101.6	101.5	105.2
March	98.7	98.9	104.7	102.1	104.9
April	96.9	100.0	103.3	102.8	103.7
May	98.5	98.5	102.4	101.3	105.2
June	101.5	99.2	102.8	104.5	107.3
July	101.3	96.9	98.3	105.2	105.0
August	104.2	94.8	100.7	104.8	103.2
September	101.7	95.8	102.8	106.0	107.1
October	99.9	96.6	104.4	108.3	107.5
November	101.1	96.0	106.1	108.9	106.3
December	98.2	97.5	107.1	107.4	100.7
Average	99.8	97.5	102.8	104.6	105.1

PHILADELPHIA

	1923	1924	1925	1926	1927
January	91.0	92.6	93.8	107.9	112.0
February	100.3	96.7	94.2	110.4	115.1
March	104.1	95.2	97.1	111.2	114.2
April	106.3	92.9	92.1	108.2	109.0
May	114.4	88.3	96.3	108.2	107.9
June	115.2	85.0	96.1	107.1	102.8
July	115.1	78.5	95.4	106.3	100.4
August	107.7	82.4	102.5	108.5	103.2
September	111.9	87.8	103.3	112.4	107.0
October	113.2	93.4	112.3	121.8	108.4
November	111.5	94.0	111.8	119.8	106.3
December	112.7	99.2	115.0	120.1	107.0
Average	108.6	90.5	100.8	111.8	107.8

PITTSBURGH

	1923	1924	1925	1926	1927
January	102.6	110.4	92.3	106.2	94.6
February	104.7	117.1	100.6	104.8	100.7
March	108.1	115.0	90.6	109.3	103.7
April	103.1	113.9	94.0	106.0	101.7
May	114.0	106.9	93.9	101.5	94.4
June	112.2	92.2	93.9	103.9	94.1
July	99.1	83.6	86.1	93.9	82.5
August	109.4	89.5	86.7	96.7	87.0
September	109.7	88.7	87.9	100.1	82.8
October	114.5	90.1	95.2	104.2	81.4
November	110.8	90.1	89.1	97.0	80.8
December	106.5	100.2	97.2	100.7	78.4
Average	107.9	99.8	92.3	102.0	90.2

READING

	1923	1924	1925	1926	1927
January	107.0	90.9	89.1	86.0	111.0
February	110.2	104.0	108.7	109.0	114.4
March	118.4	108.9	111.3	111.4	106.3
April	115.0	108.7	107.4	107.5	105.5
May	119.9	102.3	108.7	108.9	105.2
June	112.6	91.5	97.7	107.0	97.0
July	98.5	56.9	80.0	98.6	87.8
August	95.8	77.8	93.3	102.3	98.1
September	102.5	81.4	89.5	102.6	88.8
October	94.2	92.5	104.6	111.4	102.5
November	101.3	93.5	106.5	113.4	103.2
December	105.2	104.2	109.6	113.8	99.6
Average	106.7	92.7	100.5	106.0	101.6

ALLENTOWN

	1923	1924	1925	1926	1927
January	86.9	91.8	90.0	105.3	98.8
February	90.2	99.5	98.4	111.0	103.8
March	97.9	96.6	99.5	112.1	106.8
April	97.5	97.7	102.0	111.6	109.2
May	103.8	96.2	106.4	110.0	110.8
June	102.1	91.7	105.3	113.6	114.4
July	104.8	89.5	109.3	103.9	105.8
August	98.3	94.1	113.5	108.1	108.4
September	98.9	92.8	111.3	105.0	103.1
October	103.8	99.8	116.2	110.8	107.5
November	100.7	96.8	110.6	106.9	103.7
December	97.0	96.8	112.4	104.1	102.1
Average	98.5	95.3	106.2	108.5	106.2

ERIE

	1923	1924	1925	1926	1927
January	97.5	87.6	92.0	103.9	100.4
February	100.5	99.4	95.2	108.6	105.4
March	108.6	103.0	99.9	107.7	106.4
April	111.3	104.5	98.8	107.0	108.0
May	117.2	102.5	100.8	105.2	109.6
June	118.3	98.4	99.1	106.5	112.0
July	114.9	88.8	92.6	100.6	104.4
August	116.5	85.8	95.4	108.1	107.1
September	113.9	87.3	91.4	108.8	106.8
October	109.2	88.8	100.8	110.7	105.5
November	103.0	83.6	101.8	108.7	102.9
December	93.1	93.9	104.1	104.7	101.9
Average	108.7	93.6	97.7	106.7	105.9

HARRISBURG

	1923	1924	1925	1926	1927
January	100.0	95.3	95.4	109.4	106.6
February	96.6	104.5	97.8	115.5	116.8
March	110.3	103.7	96.6	113.3	112.9
April	112.3	97.0	99.3	109.4	107.9
May	119.7	93.3	97.2	108.7	112.8
June	118.4	91.6	100.6	109.3	112.9
July	112.6	83.3	103.6	104.8	106.6
August	104.7	90.4	102.2	108.2	111.5
September	98.1	93.6	97.0	110.4	116.6
October	102.9	102.4	107.9	113.0	115.3
November	91.0	91.1	102.1	105.2	105.8
December	90.9	90.0	105.7	105.8	103.0
Average	104.8	94.7	100.5	109.4	110.7

HAZLETON—POTTSVILLE

	1923	1924	1925	1926	1927
January	100.2	100.7	103.3	110.4	108.8
February	104.7	102.4	106.8	110.8	110.1
March	106.6	95.1	100.5	107.1	107.2
April	113.1	90.9	96.1	107.9	113.0
May	109.2	86.0	103.0	103.1	110.9
June	106.0	82.0	103.4	101.0	112.8
July	99.8	83.4	102.1	100.0	103.5
August	94.3	90.3	109.4	101.2	106.4
September	95.4	92.5	106.8	104.3	106.6
October	94.7	98.1	111.0	104.2	111.3
November	96.8	97.1	111.2	112.7	107.6
December	91.7	102.7	112.8	109.7	110.7
Average	101.0	93.4	105.5	106.0	109.1

JOHNSTOWN

	1923	1924	1925	1926	1927
January	97.4	98.1	121.2	87.9	92.1
February	96.3	122.5	118.3	88.9	91.1
March	92.5	117.0	111.5	86.1	92.7
April	97.4	109.1	109.5	84.4	92.5
May	113.3	112.1	104.7	83.0	91.7
June	110.8	93.1	77.2	84.9	92.1
July	99.5	81.1	84.5	84.4	77.7
August	100.8	88.4	93.6	86.1	85.6
September	111.0	89.1	84.6	91.1	80.5
October	96.4	93.0	95.6	92.4	75.2
November	88.5	93.3	93.8	91.4	67.9
December	93.7	114.3	97.4	96.3	68.6
Average	99.8	100.9	99.3	88.1	84.0

LANCASTER

	1923	1924	1925	1926	1927
January	85.0	97.1	105.7	104.5	94.3
February	96.2	100.2	113.6	107.4	94.4
March	103.9	98.0	112.2	106.2	94.8
April	102.0	94.9	102.9	102.7	93.4
May	102.5	84.6	110.9	99.5	91.0
June	98.3	82.6	109.2	95.9	90.8
July	97.7	86.2	100.9	85.0	82.6
August	96.0	100.6	104.5	91.9	91.7
September	89.6	103.6	103.7	96.4	88.3
October	91.6	104.7	109.6	97.5	92.3
November	97.5	97.9	103.4	95.7	94.0
December	101.0	107.0	104.4	97.6	92.2
Average	96.8	96.5	106.8	98.4	91.6

NEW CASTLE

	1923	1924	1925	1926	1927
January	89.9	112.9	107.3	84.9	97.0
February	93.6	120.8	112.0	87.9	101.2
March	100.3	119.7	108.5	89.9	97.8
April	104.5	117.9	101.0	89.1	89.2
May	122.3	104.4	94.3	86.0	87.1
June	122.4	93.0	84.4	88.8	86.3
July	110.1	83.2	78.7	83.5	81.6
August	118.0	84.9	79.2	94.2	84.3
September	115.2	91.4	78.0	93.0	73.4
October	119.5	91.5	80.4	99.7	80.1
November	113.4	82.0	79.7	90.5	73.8
December	109.5	93.8	86.8	97.6	79.8
Average	109.9	99.6	90.4	90.4	86.0

SCRANTON

	1923	1924	1925	1926	1927
January	82.4	102.1	101.3	83.5	72.7
February	90.3	116.8	114.3	88.6	81.6
March	101.3	114.3	115.7	89.1	80.1
April	99.9	102.9	113.2	81.1	75.7
May	103.7	97.8	115.6	78.2	71.1
June	103.7	82.7	98.2	77.0	70.8
July	95.2	71.8	97.7	71.3	60.6
August	101.6	79.9	104.9	72.0	65.9
September	100.6	90.6	83.1	72.0	67.0
October	108.4	99.2	89.1	79.8	72.4
November	108.7	103.1	90.3	80.1	71.4
December	107.3	116.8	94.4	86.4	76.6
Average	100.3	98.2	101.5	79.9	72.2

SUNBURY

	1923	1924	1925	1926	1927
January	110.3	87.4	100.1	121.8	126.5
February	106.8	81.9	104.5	121.5	119.1
March	103.9	82.3	113.4	114.6	123.2
April	110.7	72.8	113.9	110.1	122.2
May	119.8	69.1	127.3	111.3	114.9
June	112.1	68.7	123.7	110.9	102.3
July	109.8	58.3	116.4	113.6	105.3
August	106.5	67.7	115.1	124.8	116.9
September	110.9	80.0	110.5	122.8	104.5
October	110.8	91.1	114.8	131.9	106.4
November	88.9	85.6	123.4	127.0	116.8
December	83.9	92.0	125.8	135.6	124.9
Average	106.2	78.1	115.7	120.5	115.3

WILKES-BARRE

	1923	1924	1925	1926	1927
January	90.6	86.1	88.6	110.4	105.4
February	98.2	102.7	101.4	123.4	102.8
March	102.4	99.9	107.9	120.1	100.0
April	100.8	106.0	110.9	120.6	87.8
May	106.0	95.6	117.7	98.5	98.7
June	103.2	87.6	113.9	101.1	96.8
July	93.5	85.2	112.1	99.2	91.3
August	94.3	98.9	100.6	103.2	84.7
September	84.7	94.6	99.2	102.0	93.9
October	88.1	102.0	107.8	109.8	97.0
November	84.4	105.3	121.3	105.4	97.1
December	86.7	99.5	121.8	107.1	84.9
Average	94.4	97.0	108.6	108.4	95.0

WILLIAMSPORT

	1923	1924	1925	1926	1927
January	90.6	92.7	99.2	116.0	114.7
February	90.5	99.1	108.1	122.4	128.8
March	100.7	97.0	100.9	124.5	125.3
April	98.4	93.7	108.9	128.4	127.1
May	100.9	91.3	107.2	120.1	121.3
June	99.3	95.4	117.0	121.4	120.1
July	85.8	86.9	119.8	113.8	108.4
August	83.5	90.7	111.5	113.9	110.1
September	86.2	91.4	111.7	108.4	123.0
October	86.2	95.3	121.8	108.4	118.1
November	91.4	101.7	120.8	113.6	120.1
December	93.8	107.7	123.1	114.7	126.8
Average	92.3	95.2	112.5	117.1	120.3

YORK

	1923	1924	1925	1926	1927
January	95.8	99.9	97.4	100.5	103.0
February	95.3	99.9	99.3	98.7	101.6
March	100.1	101.8	106.2	100.0	100.6
April	99.1	105.0	101.8	102.0	98.4
May	105.1	99.1	101.1	99.8	100.0
June	107.9	99.3	98.9	103.4	101.4
July	105.3	93.1	93.3	100.3	97.5
August	105.1	91.5	100.1	100.6	98.6
September	106.4	94.3	96.9	103.4	101.1
October	104.7	91.1	99.9	105.9	94.8
November	103.9	93.8	102.0	105.5	100.6
December	103.3	95.1	107.2	108.4	99.0
Average	102.7	97.0	100.3	102.4	99.7